

European Distance and E-Learning Network (EDEN) Conference Proceedings

EDEN 2015 ANNUAL Conference

Expanding Learning Scenarios

Opening Out the Educational Landscape

EDEN 2015 Annual Conference

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António Moreira Teixeira, András Szűcs and Ildikó Mázár
on behalf of the European Distance and E-Learning Network

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Introduction – Expanded learning scenarios: What Society Would Expect – What Digital Pedagogy can Offer?

The landscape of learning has changed substantially over the past few years. The ever-improving performance of mobile devices and the development of networking infrastructure continue to increase the appeal of new powerful educational tools. The rapid spread of technologies, reflected in their untameable demand and use, the momentous development of research as well as practices inevitably transform the information society – mostly outside of institutional settings and often along unexpected pathways.

The increased amount, improved quality and open accessibility of digital learning content are furthering rapid transformation of user habits and the social impact of new technologies in education. The re-interpretation of the terms ‘openness’ and ‘resource management’ have altered socio-economic and cultural aspects considerably. New educational business models and stakeholder alliances emerge, supported by fresh social and economic demands, scale, and clusters of interest.

All of this places new challenges on the educational system. The education and training sector needs to improve its efficiency by scaling up innovative solutions to better meet the current requirements of society. Research and innovative projects often deal with systematic data analysis, smart observations and validation. New functions and interactions between learners, teachers, researchers and managers emerge and shape the processes more than ever before.

How can the progressive and innovative academic and professional international community contribute in 2015 to a better understanding of the above expansion of the educational landscape? The traditional classroom is no longer an ideal place for education. We are living in a time when a collaborative learning culture blends with an ever more hybrid technological environment. There are great opportunities for, and availabilities of, modern solutions. Meanwhile, we are missing achievements in the burning issues of employment, corporate co-operations, anticipating and preparing for the jobs of the future, and strengthening vocational and in-company learning.

For Europe, as the focus of the new educational programme Erasmus+ indicates, priorities include serious enhancement of mobility in the education and training sector. This implies an impact for the increased and better use of ICTs (virtual mobility), which is a challenge for the field of learning innovation.

Conference themes help to understand and exploit the stimulating progress in the field, like: Multiculturality in the classroom – Intersection between higher education and MOOCs – Users as creators and curators of learning resources – Sharing open activities between higher educational institutions – Sustainable business models for openness in education – Learning analytics from learners’ perspective – Data-driven learning personalisation – Empowering learners: Promoting self assessment and reflection – Tools for crowd participation and peer

support – Scaling up pedagogies for crowd learning – Changing leadership models and practices – Challenges of diversity to learning and teaching.

The Conference Host and Partner is the Universitat Oberta de Catalunya (UOC), a truly innovative institution. Rooted in Catalonia and open to the world, the world's first online university is sensitive to the diversity of the global environment and committed to empowering development and social change through education. UOC at the Conference celebrates its 20th Anniversary with special sessions, reflecting on the contemporary challenges in our field.

András Szűcs
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APPLYING BIGGS CONSTRUCTIVE ALIGNMENTS TO ONLINE INTERDISCIPLINARY EDUCATION

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Introduction

Today's world is facing complex and dynamic challenges including climate change, sustainability, energy and public health. These challenges call for collaboration and complex solutions which are often demonstrated in interdisciplinary approaches (Lawson, 2010; NSF, 2006; NIH, 2004). More and more scientists are encouraged to work across disciplines (NSF, 2006).

Interdisciplinary education has been emphasized by many academic and scientific institutions, because of being facilitative to holistic understanding of complex situations, humans, contexts and issues, (CFIR, 2005; Holley, 2009; Fischer, Tobi & Ronteltap, 2011; Zarin, Kainer, Putz, Schmink & Jacobson, 2003). Especially in the field of health care, due to the complexity in health-related problems, interdisciplinary education has become a phenomenon since 1960s.

At the same time researchers and practitioners have become increasingly interested in the potential of online learning, as economic constraints leave fewer resources available for professional development (Friesen, 2009). Online technologies are developed to improve learning activities and professional development opportunities with the benefits of connectivity, flexibility and interactivity (Knight, 2004) between members with different perspectives and levels of expertise in a wide variety of contexts.

Facing with these actual challenges, our European FP7 training network, iCARE (improving Children's Auditory Rehabilitation) aims at providing interdisciplinary training for 16 junior researchers from different disciplines in 9 institutions in Europe, with the objective to create a new generation of researchers capable of working cross disciplines for the ultimate aim of improving the inclusion of children (4-12 years old) with hearing impairment (HI) in an oral society.

Communication through language is vital to develop and maintain everything around us. By 15 years of age, about 5 out of 1000 children suffer from a moderate, severe or profound HI that can potentially affect communication, learning, psychosocial development and academic

achievement if not handled appropriately. The EU promotes the active inclusion and full participation of disabled people in society. However, full active inclusion in an oral society can only be achieved through interdisciplinary involvements and collaboration between researchers with different approaches and expertise in different research fields and specializations (medicine, neurology, acoustics, psychology, audiology, engineering, speech therapy, special education, etc.).

Unique and challenging about the iCARE network is the wide training consortium that ranges from academia, industry and socio-economic agencies, while the 9 full partners and 7 associated partners are located in different countries in Europe. Training is provided in a blended mode, both face to face and on-line. Besides traditional training in local host institutes and a few occasions of face to face interdisciplinary training at winter schools and seminars, the researchers need to receive interdisciplinary education from different geographical locations. Online learning appears as the learning scenario which permits in iCARE to reach its main goal: providing an online interdisciplinary education training focusing on the auditory rehabilitation of children with hearing impairment.

Our current research aims at designing an interdisciplinary educational model to support iCARE interdisciplinary training. In this paper, we will first present the literature review of interdisciplinary education, then propose our online interdisciplinary model, and discuss the methodologies to evaluate the model including the limitations of the research.

Literature review: the landscape of interdisciplinary education

Despite increasing publications on the developments and deliveries of interdisciplinary education programs in higher education, the understanding of interdisciplinary education is still limited and the challenges remain high, such as how the interdisciplinary training should be organized and facilitated (Hall & Weaver, 2001; Morse, Nielsen-Pincus, Force & Wulforth, 2007; Rhoten & Parker, 2004). The areas that draw more attention from researchers are the interdisciplinary educational model design, evaluation and methodologies.

With regard to interdisciplinary educational model design, there is not a widely accepted model yet. Critics of the educational model design rise from the following aspects: i) Lack of theoretical support from learning and psychological background (Cooper, Carlisle, Gibbs & Watkins, 2001); ii) Poor instructional design such as lack of assessment methods or constructive alignment (Biggs, 1996; Cooper et al., 2001; Thistlethwaite, 2012) and iii) Lack of information to guide designing interventions (Remington, Foulk & Williams, 2006).

Evaluation remains one of the least-understood factors, despite a large number of publications on interdisciplinary practice (Klein, 2008). Lattuca, Voigt and Fath (2004) suggested that besides the need to evaluate the effectiveness of interdisciplinarity, the evaluation of learning and teaching process are also needed. Many researchers (e.g. MacDonald, Walton & Sun, 2008; Thistlethwaite, 2012) stated that the development of valid, reliable and feasible assessment is a major challenge for interdisciplinary education.

As for the evidence of interdisciplinary education, students were found to benefit from interdisciplinary education through change of attitudes, beliefs, and knowledge, but fewer studies reported changes in behavioural level. And primarily short-term effects were represented (Cooper et al., 2001; Thistlethwaite, 2012). The methodologies of interdisciplinary education studies are often accused of being unrigged, such as: limited outcome measurement, little evidence from controlled trials, controlled before and after studies, and interrupted time series studies (Cooper et al., 2001; Thistlethwaite, 2012).

Although the challenges for interdisciplinary education are high, as Thistlethwaite (2012) stated, the interest to develop best practice models based on evidence of effectiveness in interdisciplinary education is increasing both in education and research. Learning from the lessons of previous studies, we designed the interdisciplinary education model for iCARE.

Conceptual framework: an interdisciplinary educational model in the context of iCARE

Fundamentals of the interdisciplinary educational model design

As the expected iCARE model requests integration of instructional design, interdisciplinary education and online learning, our design of the iCARE interdisciplinary educational model is based on: the instructional design framework ADDIE (Analysis-Design-Development-Implementation-Evaluation), the literature review on interdisciplinary education, and the potential of Biggs constructive alignment in interdisciplinary and online education.

The ADDIE model is commonly used for guiding instructional designs. The ADDIE concept is being applied in our research for incorporating fundamental elements of instructional design principles into a manageable process (Moellem, 2001), as well as for constructing performance-based learning. The analysis phase involves the investigation of learner, content, task, learning platform and the consequent influence on the design. We started with analysing the learning needs from the participants including learning styles, E-learning experience and expectations through surveys and interviews. The design phase addresses how instructional objectives shape strategies. The development phase addresses the creation of instructional materials, the learning environment and platform. The implementation phase addresses the educational interventions that executing the programs. The evaluation phase addresses both formative and summative assessment of iCARE interdisciplinary education.

Literature review in interdisciplinary education is scarce with generalized educational models because of the diversity of learning goals, learning activities, length of intervention and amounts of disciplines involved. Being aware of the critics on the model design in interdisciplinary education reviews, we try to build the model taking into account the drawbacks that were often reported in studies. For instance, the model design is underpinned by social constructivism because firstly it emphasizes how social encounters influence learners' meanings and understanding (Atherton, 2013), and it is often used in collaborative and interprofessional learning (Hean, Craddock & O'Halloran, 2009). Furthermore, the

model will provide toolkits, modules and process templates for instructors to easily develop other interdisciplinary interventions.

Biggs' 'Constructive alignment' (1996), turns out to be very instrumental for our iCARE interdisciplinary educational model, because of its multiple orientation. Constructive alignment combines both the constructivist learning theory and the instructional design. The curriculum objectives represented as "performances of understanding" are used to systematically align the teaching/learning activities which are judged to elicit those performances and the assessment of the performances. Being student-centred and outcome based, Biggs' Constructive alignment is influential in higher education. Furthermore, it has shown its influence not only in traditional disciplinary higher education, but also in interdisciplinary and online instructional design (e.g. Bennett et al. 2012, Borrego & Newswander, 2008; Slaouti, 2007). Because of the multiple orientations to learning theory, instructional design, interdisciplinary education, and online learning, Biggs constructive alignment appears to be a suitable framework for us to build our iCARE interdisciplinary education model.

Therefore, following the processing guidelines of ADDIE and guided by the literature review, we design the iCARE interdisciplinary model based on Biggs constructive alignment and adjusted it into online interdisciplinary learning context.

Description of the iCARE interdisciplinary educational model

The iCARE interdisciplinary educational model (Figure 1) is composed of four parts: learning needs analysis, curriculum objectives, teaching/learning activities and assessment tasks. The curriculum objectives functioning as the central part of the model, are used to systematically align the teaching/learning activities and the assessment tasks.

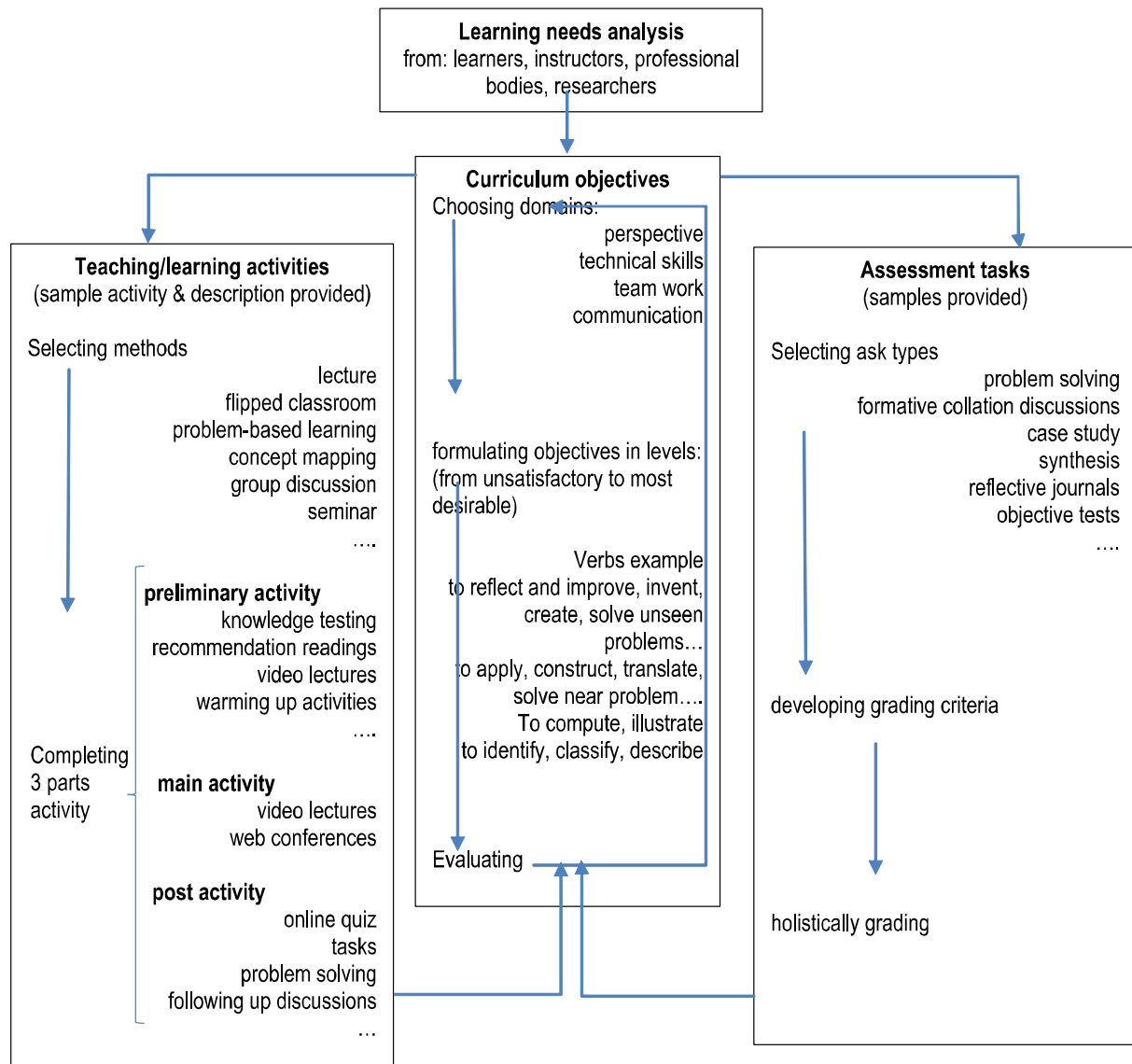


Figure 1. iCARE online interdisciplinary educational model

Analysis of learning needs

Learning needs analysis forms the origin of curriculum objectives. Data from different parties including learners, instructors, professional bodies, and educational researchers are to be collected to define the curriculum objectives.

Curriculum objectives

Constructive alignment starts with clearly stating, not what the teacher is going to teach, but what the learner is supposed to be able to do and at what standard (Biggs & Tang, 2007). Due to the complexity and the initiation of iCARE interdisciplinary education, the expected outcomes of learners need to be identified first. A four-step cycle is designed to accomplish the goal of defining the curriculum objectives: i) analysing learning needs; ii) deciding the domains of the desired interdisciplinary outcomes; iii) formulating objectives in levels, which is to complete the writing of “performances of understanding” in different levels including unsatisfactory, barely satisfactory, moderately satisfactory, very satisfactory and most

desirable. The objectives should be described in verbs that represent the levels of performance of understanding, iv) evaluating to adjust the result.

The teaching/learning activities

The teaching/learning activities are designed to require students to apply, invent, generate new ideas, diagnose and solve problems (Biggs & Tang, 2007). Two steps are identified in the iCARE model to design teaching/learning activities. The first step is to select the appropriate learning method, and the second step is to complete the three parts activity design (pre, main and post).

Various teaching/learning methods are provided in the iCARE model, including lecture, flipped classroom, problem-based learning, concept mapping, seminar, group discussion, etc. Both teacher controlled and peer controlled activities are available in the choices. The provision of the methods is based on research in enhanced learning, blended learning and interdisciplinary learning.

Based on the studies of acquisition of intellectual skills and development of expertise (Van Lehn, 1996; Ericsson & Smith, 1991), as well as the fact that students engagement is often absent in online learning, the teaching/learning activities are designed in three parts: preliminary activity, main activity and post activity to enhance the online learning experience. According to different teaching/learning methods, various web-based technologies are used to support the teaching/learning activities. For example, the videos could be used for the main activity in a lecture, or for the preliminary activity in a flipped classroom, or for the post activity in a seminar.

The feedback of teaching/learning activities goes back to the curriculum objectives to make necessary adjustment.

The assessment tasks

Three steps are listed to design the assessment tasks: selecting the assessment type, developing grading criteria of desired learning outcomes, and holistically grading.

The assessment tasks will tell not how well students have received knowledge, but how well they can use it, such as in solving problems, designing experiments, or communicating with different audiences (Biggs & Tang, 2007). Different types of assessment tasks are provided with examples in the model, including writing tasks, objective tests, various performance assessments such as case studies, problem solving, projects, etc.

In order to judge how well the desired learning outcomes have been met on the basis of the students' performance on various tasks and thereafter to provide information to students by the assessments, qualitatively and holistically assessment methods are used in the second and third steps.

The feedback of assessment tasks will go back to the curriculum objectives to make necessary adjustment.

Future directions

The research aim is to further design, develop, implement and evaluate the iCARE interdisciplinary educational model. The model could be used for both PhD and Master students training, and will scaffold teachers in future interdisciplinary educational design. Our hypothesis is that iCARE partners perform better in (developing) interdisciplinary competencies when learning happens according to the iCARE interdisciplinary learning model. Experiments with control groups and analysis within and between groups will be conducted to testify our hypothesis. The fact that learners with different backgrounds have different requests for interdisciplinary training makes the measurement of experiment delicate.

The expected result is a testified educational model which can be used for online interdisciplinary learning in the field of auditory rehabilitation. At the time of the conference we hope to present some preliminary results of how the model is used in interdisciplinary learning (both face to face and on-line) by the iCARE community of researchers.

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MICRO-INNOVATIONS AND STAKEHOLDERS ENGAGEMENT AS DRIVERS FOR SYSTEMIC CHANGE IN ICT-SUPPORTED LEARNING

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Abstract

The paper discusses the findings and the lessons learnt of two research projects that have worked to understand how to support mainstreaming and scalability of ICT for learning in Europe. These are the VISIR project, which explored how scouting grassroots micro-innovation practices can help to successfully mainstream the potential of ICT to contribute to change in education, and the HoTEL project, which worked on how to appropriately engage stakeholders in supporting innovation in the field of ICT for learning. Building on the main findings of these projects as well as on other recent attempts to valorise innovation in education, the paper presents some ideas targeted to decision makers, researchers and practitioners, as possible starting points for future bottom-up efforts of innovation valorisation in the field of ICT-supported learning.

The time has come to scale-up ICT-supported learning

A number of recent studies show that ICT is increasingly used in learning settings throughout Europe from school education to higher education to vocational training and adult learning, with different degrees of penetration in different sectors of E&T and in different countries (Aceto et al., 2014). At the same time, some national ICT-for-learning policies are having an impact on the level of innovation that the Lisbon strategy and the ET2020 strategy have set as one of the main targets for the European society in 2020. The evolution of the concept of ICT for learning in the European policy discourse, mainly brought forward by the European Commission, shows how the official “narrative” has moved from a strongly technology-driven experimental-like niche at the time of the DELTA and ESPRIT programmes in the late 90s, to a more mature phase where the main aim was to develop new solutions able to reach as much learners as possible – during the period 2002-2010 with the eLearning Action Plan – to the present phase, where the key policy objective is scalability.

The European Commission policy priority is clear: “Evidence indicates that the EU-wide experiences on innovative learning need to be scaled up into all classrooms, reach all learners and teachers/trainers at all levels of education and training. A full uptake of new technologies and OER requires more than boosting experimentations across Europe” (European Commission, 2013a, 2013b). Clearly, the European Commission wants to go beyond experimentations, and to put in place the conditions for mainstreaming the meaningful and

high-impact use of ICT for learning in all possible lifelong learning settings. This focus on scalability clearly responds to a recognised mismatch between the potential of ICT to support the desired change in education and the reality in most European countries, where education is in fact far from having fully embedded the potential of new technologies, to improve the efficiency, accessibility and equity of training and learning systems.

The VISIR lesson: micro-innovation matters

The rationale of the VISIR project (www.visir-network.eu), which was supported by the European Commission under the LLP Programme, is that in order to uncap the potential of ICT for learning as a driver of change for our economies and societies, we need to move from fragmentation and piloting to effective systematic adoption. To address this need, the project has addressed three major gaps: the “understanding gap”, the “networking gap”, and the “mainstreaming gap” of ICT for learning in Europe. In this light, VISIR represents a rather unprecedented networking effort, bringing together seven European networks and one research institution: the MENON Network, the European Association for Adult Learning (EADL), the European Distance and E-learning Network (EDEN), the European Foundation for Management Development (EFMD), the European Learning Industry Group (ELIG), the European Interest Group on Creativity and Innovation (EICI), The European Foundation for Quality in e-Learning (EFQUEL), and K.U. Leuven.

In its three years of work, VISIR has produced and validated a long-term vision on the contribution of ICT for transforming education and training systems towards 2020, through the analysis of the following eleven “domains of change”: Aims of Learning Systems, Content and Competences, Orchestration of learning, Valuing Learning, Assessment, Funding and Governance, Integration, Inclusiveness, Teaching, Quality and Learning spaces. Further, four broad stakeholders consultations have been run, collecting more than 7,000 opinion, where the project findings have been validated with the broad community of e-learning practitioners in Europe. Finally, two mainstreaming seminars were organised in 2013 and 2014, in collaboration with other projects working in the field of ICT for learning, in the Committee of the Regions in Brussels, reaching more than 200 participants and engaging a different range of stakeholders, from policy makers to researchers to grassroots innovators.

The “grand challenge” that VISIR has tackled is the mainstreaming gap of ICT-for-learning innovation in Europe: on the one side a lot of spontaneous innovation exists in Europe at different levels, on the other the cases of successful large-scale adoption are extremely limited. To better understand this gap, the VISIR consortium has been discussing together with flesh-and-bone innovators – during all the project events and online – the underlying conditions for scalability and mainstreaming, focussing on the needed incentive to change from both a policy and an institutional perspective and on the limits of current innovation approaches in the field of education, the increasing massive availability of ICT tools, with an increase usability.

VISIR has tackled the above problem from a rather new standpoint, that is by focussing on *micro-innovation practices*: in a nutshell, innovative experience that are micro in terms of implementation scope, size of idea-generator, and degree of actual change, but that bear a very high impact potential. The project has first identified and mapped – according to emerging trends – some 120 practices, to then select the most promising and representative 23 cases. These cases, which can be browsed in the www.visir-network.eu site, span from school education to adult and informal learning, including cases with a high degree of ICT use and other that use technology in a very simple – but smart – way. Target groups are as varied as possible: from school pupils having to learn biology, to medical doctors dealing with particular problems, to software development students working collaboratively and cross-assessing each other, to truck drivers learning just what they need to know in a particular moment, to elderly citizens being socially included through blogging, just to make some examples.

If we look at the 23 most representative cases selected by VISIR, some development patterns seem to emerge, that tell us something on what characterises micro innovation ideas with high potential. First, successful micro-innovators are not replicating current approaches, on the contrary they are typically proposing something genuinely new in terms of pedagogy and use of technology. Second, innovators seem to be prizing interactive and collaborative approaches: almost all the selected cases are built on some kind of collaboration scheme, and have a high degree of interactivity. Third, in all the cases technology works as an enabler, that is to say a means to an end: in some cases the technology used is absolutely simple and affordable, what is innovative is not the ICT solution but the use that the cases is making of it. Fourth, it clearly appears that Public-Private Partnerships (PPP) encourage innovation: even if the VISIR research team was not looking specifically for PPP-based cases, we found that a high degree of the selected cases are built on these kinds of partnerships. This finding is in line with the conclusions of a number of recent reports (UNESCO, 2014; United Nations, 2014), which converge on the fact that encouraging stable, long-term private investment can have a positive impact on sustaining innovation in education and that sustainable projects are searching for capital, but new channels and innovative financial instruments are needed to link the two.

The HoTEL lesson: Stakeholders matter

Similarly to VISIR, the HoTEL project (www.hotel-project.eu, supported by the Seventh Framework Programme of the EU) aimed to design and test a mechanism to support innovations – and innovators – in the field of Technology Enhanced Learning (TEL) to move from the pilot and experimental phase to broader mainstream and adoption.

One of the starting points of HoTEL is that ICT for learning does not need an “innovation model”, since – as it appears from the heterogeneity of the VISIR micro innovation cases – trying to codify all the possible innovation paths in a sector such as education would only bring additional rigidity to the system. What is needed – in the HoTEL view – is an attempt to design an “Innovation support model”. While an innovation model conceptualises the

different steps and processes that bring innovations to be generated, adopted, incorporated in use, scaled up and eventually exploited in commercial or institutional ways, an Innovation Support Model refers to the way a “professional body” of analysts and stakeholders representing users categories, advisors, fund raisers, institutional and private investors, etc. can help innovators to succeed, or to succeed more quickly than they could do without this support. In the field of TEL, innovation may frequently start in a classroom or in a community of practice, or may be the result of massive use of a technology not born for educational purpose: this means that any “innovation support model” must fit into the variety of modes and contexts in which innovation may emerge, and have different, adaptable ways to support it.

The main purpose of HoTEL has therefore been to design, test and improve an effective way to support innovators using ICT in learning settings, which may correspond to different innovation models co-existing in the TEL field. In order to do this the project selected a set of innovators and innovations to be accompanied, for a period of time, through a series of interactions with experts, stakeholders’ representatives and other critical colleagues who have concretely contributed to strengthen the success prospective of these innovations and contextually reflect on the proposed support in terms of content, process, outcomes and potential impact.

The *HoTEL Innovation Support Model (ISM)*, a well-codified process capable of i) providing decision makers with an analytical framework to classify TEL innovations and properly understand their advantage/contribution and potential within their action context, ii) helping innovators to properly formulate their ideas in a way which aids a possible innovation uptake and iii) assisting innovators in developing strategies to improve their innovation’s diffusion/adoption potential. The proposed IEM is not composed of prescriptive actions, but rather of a set of three adaptable phases, which can be implemented through a set of eight practical steps, as in the picture below.

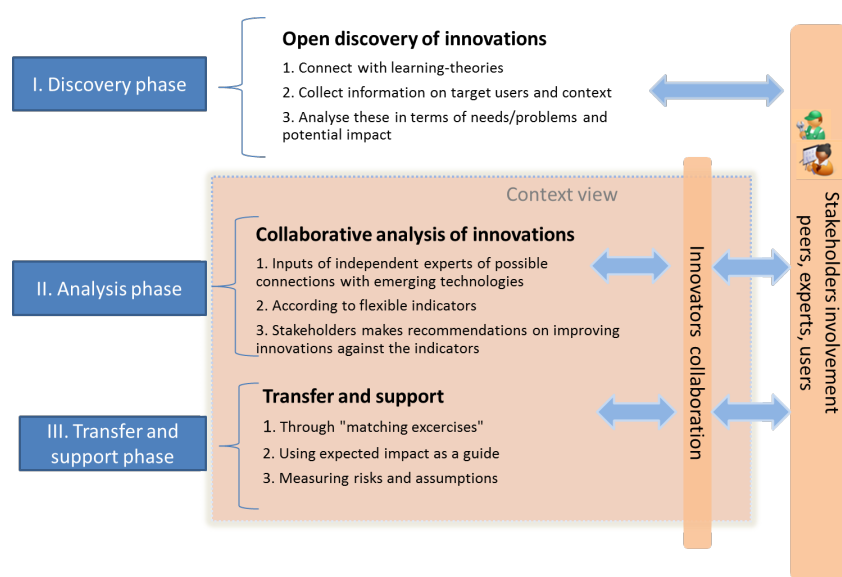


Figure 1. Main elements of the HoTEL Innovation Support Model

The ISM on its general conceptualization is composed of three phases. First, a discovery phase, where an innovation is discovered and described in a structure format so that different innovations can be compared with each other, and where added value is provided by connecting with learning theories and by supporting the innovation leader in context exploration and in stakeholders (including main “influencers”) identification. Second, an analysis phase, where the innovation is analysed from a full multistakeholder view, through a number of flexible protocols with macro categories of analysis such as the context of the innovation, the impact of the innovation, the stakeholders involved, the process of development of the innovation, the serendipitous elements in innovation, or the unique nature of the innovation. Third, a transfer and support phase, aiming to support an innovation either to be transferred to another context or to be further developed and scaled within the same context. During the process, a number of matching exercises need to be done, e.g. mapping stakeholders from the originating context to the new context, isolating critical success factors for the innovation and transferring them to the new context, etc.

An in-depth analysis of innovation models applied to the ICT for learning domain (HoTEL Consortium, 2014) has brought to the conclusion that different methods and steps need to be taken to analyse TEL innovations according to their nature (incremental, disruptive or systemic) and their types (technical -technology push, business – market pull, learning practices – bottom-up and social – social needs pull). Further, successful innovations need to take into consideration: i) the integrated design process and the organizational architecture of the institution that adopts the innovation (e.g. to a company, a learning institution such as a University, a school or a professional organization; ii) the design and implementation of the “product, services, practice”; and iii) the design and implementation of new technologies (du Preez & Lou, 2008). A lot of very good ideas or even pilot products in TEL, whether they are coming from technology push, or practices (market pull) or research they often fail to be successfully adopted and mainstreamed. A successful management of the innovation process (from idea to market) and a good understanding of the different innovation models are needed in order to guide this process from the stage of an idea to adoption and mainstreaming.

TEL being such a complex domain, it is safe to argue that the majority of TEL innovations would require the sharing of ideas, contributions and collaboration of efforts from research, technology, practitioners, including software and learning solutions developers. That is why the main result of the HOTEL is that support to innovation in the field of ICT for learning can take different forms – of which the ISM proposed by the project is just one attempt – but must rely on stakeholders’ engagement. The road to success for a TEL innovation depends in fact to a large extent on the possibility to be understood and supported by some categories of stakeholders that change with the context (e.g. industrial investors, school leaders, publishers, policy makers, teachers’ networks, student associations, consultants, et cetera). Not all of them might ultimately influence every kind of TEL innovation with similar leverage, but it is important to consider the full spectrum of involved interests to select the most crucial

representatives of stakeholders to discuss and support the innovation development. Furthermore, what appears a big success in a certain context may not work in another context (e.g. country, socio-economic environment, organization, or sector). It is therefore fundamental to identify not only “what works” but also “where” and “under which conditions”, distinguishing between success factors that are relatively “unique”, specific to the context, and others that can more easily be found or reproduced in other contexts. And it is important to do this by engaging as many relevant stakeholders as possible.

The road ahead

The main result arising from a throughout analysis of the VISIR and HoTEL innovations is that, whilst educational systems are trying to responded to policy initiatives that aim to stimulate innovation and promote modernisation such as the Opening Up Education initiative of the European Commission quoted at the beginning of the paper, there is evidence that institutional education environments are often inherently conservative, slow to change and not supportive to grassroots innovation. Educational settings are still mostly working in a reproductive rather than transformative mode, and are too often based on organisational cultures which are hierarchical, segmented, slow in response to external change and based on an ethic of conservatism.

These considerations are in line with the findings of some recent reports in the field. Similarly to VISIR and HoTEL, a recent report on innovation in Europe by NESTA and Lisbon Council (2013) stresses that policy in the field of education and training should include a strong experimental component, trying out new policy tools, such as funding clusters of innovators, promoting competitions and new funding schemes, and award high-impact projects by providing sustainable funding mechanisms which go beyond the typical two-years project lifecycle.

A recent IPTS study (Panagiotis, Law & Punie, 2013) – based on case studies having already achieved a significant degree of scale and impact – identifies four principles that differentiate the strategic effectiveness of different innovation initiatives. First, the report confirms that there is no single recipe for innovation in the field of TEL and that there is no one size fits all solution to innovation: each case might have its own features and route to scalability and mainstreaming. Second, ecological diversity of innovations seem to foster scalability – the more the stakeholders are involved, the more the potential for scalability. Third, leadership for strategic alignment as a necessary condition for scalability brings to a need for a strong coordination, as diversity and multiple pathways can be a richness but also a risk in terms of effectiveness. Last, as stressed by HoTEL, multi-level, system-wide connectivity and strategic partnerships can help to mobilize resources, increase problem-solving capacity and solicit both tangible and intangible support.

Also the recently published *Beyond prototypes* report (TEL, 2014), which focuses on enabling innovation in TEL with a special attention on the UK context, is in line with our reasoning. This report stresses the “bricolage” dimensions of innovation in TEL, defined as “a productive

and creative innovation process that involves bringing together and adapting technologies and pedagogies, experimentation to generate further insights and a willingness to engage with local communities and practices” (TEL, 2014, p.6). The VISIR and HoTEL experiences fully confirm this view, as well as the consideration that TEL is a complex system where communities, technologies, learning practices and pedagogy interact. Recommending the need for meaningful innovation in TEL (with long term objectives and making sure that the adopted innovations have as a scope a positive impact on educational change), the report outlines the key role played by the context where the innovation is to be introduced and highlights the importance of collaboration processes to ensure the success of the innovation.

The work done by VISIR and HoTEL, complemented by the findings of these other researches, can help us drawing some recommendations targeted to all those actors in charge of scouting and supporting innovation adoption and scalability, contributing to the change process “from the bottom”, meaning from a micro-innovation perspective, and “from around”, meaning from a stakeholders’ engagement viewpoint.

First, while certainly continuing looking at large scale policy option brought about by the Open Education and MOOCs movements, the EU as well as Members States should continue to support and fund grassroots innovation in teaching and learning, in the frame of its new Erasmus+ and Horizon2020 programmes as well as through the European Social Fund.

Second, innovation support systems should be consistently supporting innovators and innovation-friendly environments, by working both on tearing down systemic barriers to bottom-up innovation ideas and at recognising and rewarding the work of individual grassroots innovators.

Third, given the current economic crisis affecting Europe and determining often budget cuts in the field of education, new options for funding should be investigated, such as crowdfunding for grassroots innovation in teaching and learning. This could complement public funding and at the same time enhance an entrepreneurial spirit in institutions and actors traditionally not akin to entrepreneurship. The fact of relying on private funding that is provided by the “crowd” and not only or necessarily by private companies (with potential business interests in education) could overcome the historical resistance of education to the use of private investment for a public good.

Fourth, any innovation support attempt should take the innovation’s “multi-stakeholder ecosystem” into account, with different stakeholder representatives according to the nature of the innovation proposed, analysing and even testing the proposed innovation from a multi-perspective approach, identifying all the strengths and the weaknesses from each relevant stakeholder’s perspective. This test might be either practical, on the ground, with real users and in a real context-setting or theoretical, with a deep-thinking test bench by experts and qualified users.

In conclusion, active engagement of stakeholders and valorisation of grassroots micro innovation ideas should be two pillars of any innovation support strategy in the field of ICT-enhanced learning. If micro innovation support is a strategy that has been proving to work for example in the US, “inclusive strategies” would represent a unique feature of a European vision in support to innovation, as happens for example in the Living Labs concept. With respect to existing approaches, we propose that stakeholders should not just be expected to “comment” or “validate” a specific innovation, but should be the real engine of the process, especially since the TEL landscape is populated not only by single “grassroots” innovators but also by market and institutional forces and since more than often innovation is a societal need.

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VISUALITY AS A TOOL FOR EXPANDING LEARNING

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Introduction

The slowly spreading, century-old paradigm of traditional learning was “overtaken” by modern educational theories. Influenced by ICT, theorists of learning made a significant, impulsive turn, recognising the role of learning and knowledge sharing networks while still relying learning theory, instructional design schools such as behaviourism, constructivism and the newest, cognitivism. This paper focuses on a contradiction related to the subject both in an institutional and a broader context and considered a critical element of this process rightfully perceived as progressive. The relative old phenomenon recently seems renewed the disciplines acknowledge the role of visual tools in human communication and it is strongly promoted these days by ICT tools that facilitate visual communication in space and time.

Visual learning – paradox or contradiction?

More than half a century ago, in 1961, an MIT report on engineering design (Ferguson, 1994) mentions that “The real ‘problem’ of educating engineers is the implicit acceptance of the notion that high-status analytical courses are superior to those that encourage the student to develop an intuitive ‘feel’ for the incalculable complexity of engineering practice in the real world.” The historic experiences in interpreting and using parables called attention to the fact that these two methods of communication as visual and verbal, do not necessarily contradict each other as educational tools. Applying visual learning in the framework we may fully utilise its potentials in creating opportunities for those who want to hand over knowledge and those who wish to acquire it.

The development of visual learning may be perceived as a parabolic situation whose theoretical and partially practical analysis is particularly important, with special regard to the above mentioned aspects. Obviously, we do not have to convince those directly involved in visual learning that images have always had a significant role in human communication. Around the Millennium “visual homecoming” (Nyíri, 2014) had an increasingly strong impact on daily communication, and through that on education, on institutionalised education in particular. The mass penetration of ICT tools brought a significant spontaneity into learning processes; no wonder it was very hard to make it compatible with the visual contents of curricula designed and objectivised in algorithms that had been in turn designed in the framework of the national curricula. The visual contents in traditional textbooks and online curricula, the latter also serving as an illustration of the actual status of the technical infrastructure, have not changed much in the past decades.

Visual learning was already known in ancient societies and not only as a tool for daily communication or daily knowledge transfer. Parables created a virtual double dimension, where short, figurative speeches could convey the meaning of an idea by using a picture or metaphor of ordinary life. It should also be mentioned here that ‘parabola’ i.e. the mathematical interpretation of the word parable and the relevant graphical representations are as old as the other interpretations. The similarity between the mathematical representations and the general features of the communication typical for learning situations is believed not to be incidental.

The equation $y=x^2$ does not only determine the form of the curve, but also refers to the nature and ratio of verbal and visual information provided in the curriculum for a particular learning content (hereinafter referred to as L). The amount of verbal information is plotted on the x axis while that of visual information on the y axis. In our assumption, we presume that increasing the amount of verbal information in a linear fashion results in a significant, quadratic increase in the amount of visual information for the same knowledge element. This presumption may be considered realistic, being aware of the usual text to pictures ratio in books, etc. On the other hand, it also indicates that a significant (4-fold or even 16-fold) increase in the volume of visual information only corresponds to a 2-fold or 4-fold increase in that of verbal information for any given knowledge element on the parabola.

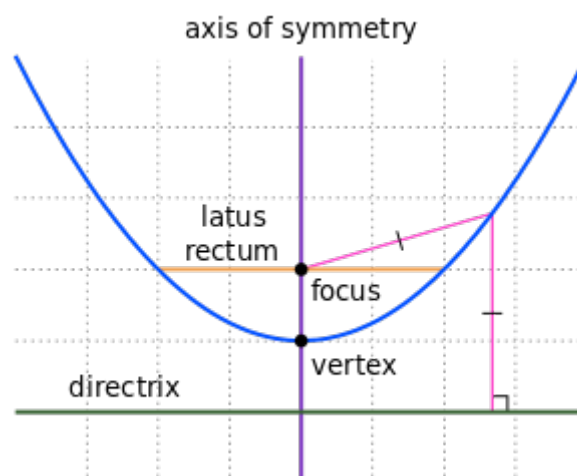


Figure 2. The classical parabola

The example emphasises that according to the equation of the parabola, for the same “directrix sections” (in our example, amounts of verbal information related to a given knowledge element) significantly more visual information is allocated (in our example, the increase is quadratic). If these ratios are altered significantly, the resulting curriculum will be predominantly verbal or predominantly visual. In both cases, acquiring knowledge will probably be severely hindered¹. The *in situ* analysis of the history of the issue as given above and the interpretation of parabolas in communication situations has led to tackling the

¹ We may note here, that in our thought experiment the ratio of verbal and visual information for a given curriculum is only based on estimations. Though these ratios may appear to be perceivable, calculating the actual functions requires empirical studies.

practical problems of visual learning from the aspect of education. Improving the efficiency of an education system predominantly relying on verbal contents may represent a significant challenge due to the lack of the necessary time and information and the slowness of correction mechanisms in the case of traditional curricula, as it was proved by several methodology experiments as cooperative methods, project based work, connectivism (Siemens, 2005) in learning. Even “modern” curricula that had been developed by the end of the 20th century had a linear structure and the prevailing dominance of verbal contents (80% on average) was changing only slowly, giving way to visual contents which in turn were mostly composed of static pictures. Though online curricula and multimedia-based e-learning representations include more dynamic visual contents (flash, video), the “logic” of curricula design has not changed in our opinion. Visual contents are still considered as mere supplements to verbal (written and oral) messages.

An alternative to the curriculum design paradigm drafted above may be increasing the ratio of visual elements in order to increase the volume of information. However, the ratio cannot be altered just randomly. Changes should fit into the parabolic equations, assuming that both formats (verbal and visual) are required by learners and their ratio is the same for a given subject, age group and other conditions.

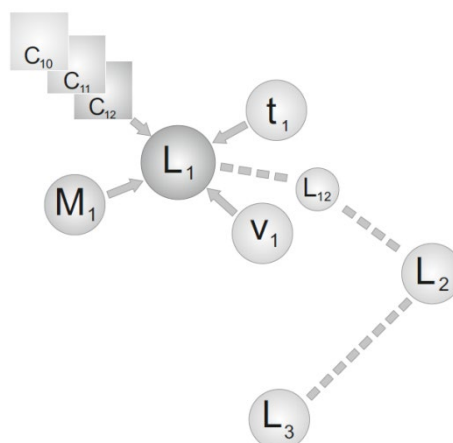


Figure 2. The schema of complex learning content net

Regarding methodological questions, with special regard to mathematics and other disciplines of natural sciences and the related applied sciences such as technical sciences and their applications, curricula are based on descriptive verbal elements (**Text** – *t*) that are supported by visual elements (**Pictures** – *V*) and mathematical formulas (**Math** – *M*). Traditional curricula (published in the format of textbooks) usually include the combination of these, structured in a rigid linear sequence, such as ‘explanation, figures, formulation, explanation’ and so on. Often random examples are only given as case studies (**Case** – *C*) to illustrate practical applications. Even tests to facilitate practicing follow this structure or they are provided in a sequenced order.

The visual representation illustrates the most important features of the structure as knowledge elements are organised into a system, which is independent of scale. For curriculum design developed in *open access*, cloud services offer a development infrastructure surpassing all previous solutions. So far we have used series like

t ----- P ----- M sometimes supported with practical examples t ----- V ----- M ----- C

Showing other connections between these elements to develop a dynamic network was typically hindered by disciplinary and temporal restrictions.

Based on our current development and the relevant hypothesis, the new curriculum may greatly facilitate the acquisition of knowledge and its control. This new curriculum, where verbal and visual elements are presented in a one to one ratio and knowledge elements are organised into a network, would be scale-independent and structured as a graph also supported by a mathematical representation to enhance both its theoretical and practical aspects and users would be allowed to extend it by case studies and practical examples. For each element of this knowledge set formulated in the virtual space in a graph structure, a *comics* would be assigned. A *comics* is a solution that combines verbal and visual information as well as a mathematical representation and can be adjusted for the needs of the given age group. These knowledge elements, to be verified upon a broad professional basis, would basically summarise theoretical and general information in a modern format, yet in an optimum volume.

As a result of the open structure, the new system is obviously more suitable for incorporating new and interdisciplinary knowledge elements than traditional solutions. The parable of visual learning becomes reality at this point. The verbal dominance in the current traditional education framework cannot be overcome due to reasons like tradition, methodology culture, generations of textbooks, whereas in the new system the t - V - M knowledge structure, originally restricted both in space and “volume” may be supported by a C set of case studies unlimited regarding the number and nature of examples, where practicality and the need for illustration *ab ovo* presumes the dominance of visual elements.

Case study – implementation of a new approach

The project “E-teaching Culture and Digital Content Development at Budapest University of Technology and Economics to be implemented between 2013 and 2015 aims at developing content, methodologies and services support of competitiveness of higher education, structural changes coming from the Bologna Process and meeting the challenges of knowledge-based economies. The project rooted in the idea that the strategic goals of the University as well as those of vocational education and training presume the continuous improvement of the quality and excellence of teachers, which in turn points at the

development of a teacher-researcher attitude essentially independent of the limitations represented by subjects or faculties².

Our hypothesis may be summarised as visual learning may provide opportunities to use parables that are able to improve the efficiency of human learning, currently based on traditional verbal communication and as such hindered by time constraints and information pressure. Developing curricula presented challenges in the fields of digitizing, multimedia editing and on-line publishing. Meta-data structure, SCORM conversion (converting contents into SCORM format with interactive elements) and formats matching the relevant criteria were defined as required by e-learning. When developing visual curriculum contents, the following new educational principles should be taken into consideration:

- Interactive techniques have become personalized and are able to integrate several functions;
- Mass mobile communication – everywhere and any time;
- Internet has become a “public utility” – Wi-Fi;
- Mass digitizing of learning subjects has become possible;
- Learning is no more the simple reception of knowledge but also a chance to participate in user development content;
- Developed forms of human-machine interaction;
- Independence in time and space;
- Widespread use of mobile devices;
- Possibilities of developing complex, media-rich “learning environments”.

Interests of students related to the principles above:

- Improved and updated curricula;
- Access to competitive learning contents;
- Extension of flexible learning forms;
- Contents and curricula for independent learning.

Our research proved that measurable learning activities show time-dependent features that correlate with the use of visual communication forms used in the study programs. The relations of methods and techniques used in the curricula to enhance the interest of students and the respective development of learning activities are worth of further examination. In order to increase the volume of information transmitted, an alternative to changing the curriculum design, may be to increase the amount of visual elements, together with the utilization of the potential of networked learning. The next research phase will focus the creation of open curricula with rich visual content which has become an important trend in the development of contents and didactics. According to our hypothesis, visual learning may

² In the framework of the project, the development of digital curricula in English and Hungarian for 27 subjects was planned. From these, 10 curricula were related to subjects in the fields of technical sciences, natural sciences and mathematics. Altogether 10 curricula were developed in English. The relevant credits totalled 77; from these, 26 ones were foreign language credits, corresponding to 33%. The developed curricula are used by about 2000 students.

provide opportunities to use parables that are able to improve the efficiency of learning, currently mostly based on traditional verbal communication thus often hindered by time constraints and information pressure.

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IN SEARCH OF LEADERSHIP: INNOVATIVE APPROACHES TO BUILDING ADAPTIVE LEARNING COMMUNITIES

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Introduction

Learning is about making connections. This range of teaching-learning connections permeates the teaching and learning environment. We connect new knowledge to existing knowledge; we connect the digital world with the real world; we connect students to content, students to students, and students to teacher. We connect the classroom to the world, competencies to skills, individuals to groups, and groups to communities. And, most importantly, we connect technology to information – information to knowledge and knowledge to application in the real world. We connect students to life (Olcott, 2014).

The mission of this paper is to explore innovative new learning environments, seek out new digital applications among teachers and students, and to boldly go where no leader has gone before. Indeed, this is a formidable challenge for all of us. It requires us to think differently about how we think, how we teach, and how we learn; and to resist a fundamental tendency of human nature – to retreat to the status quo where we feel comfortable and safe from ambiguity and the unknown. *Indeed, transformation is entirely about leadership; digital technologies are simply enablers for this transformation in the hands of the right leader, for the right reasons, and the right partners.*

Adaptive Learning Communities (ALCs) look at digital learning through a broader lens than personal or digital learning environments. Adaptive Learning Communities (ALCs) can be defined as:

The mobilization of digital technologies to transform schools through personal and community learning environments which serve as the catalyst for creating new relationships through a ‘community for innovation’ that connect all stakeholders to a common community action agenda.

Digital technologies are not simply for use in the schools by teachers and students; nor simply a showcase for Open House and parent briefings on an ad hoc basis. They are a collective community resource. ALCs explore how students and teachers adapt to these new innovations, how geographic communities play an integral role in the deployment of these innovations, and how ‘flipped communities’ may serve as a catalyst for schools to leverage

outputs by assuming new roles to create optimum educational, social and cultural impacts for community development.

The term adaptive learning has been applied to adapting technology to meet individual student learning needs. This approach is consistent with student expectations that experiences, services and products can be aligned with their individual learning needs and preferences (Boyd, 2014). Conversely, we must broaden the dialogue to explore how individuals and communities can adapt to digital technologies.

The 7Es of Adaptive Learning Communities (ALCs)

Adaptive Learning Communities (ALCs) extend previous research and theory about learning theory, PLE's, mobile technologies, and expanding real-virtual learning spaces to a broader community context. ALCs 'connect' all stakeholders in the community rather than just students and teachers. Parents, business leaders, community representatives, government agencies – the entire community is engaged in building one *mega-learning space* across the community for formal learning – but also for the collaborative linkages to address community development in all its guises.

Engage

Universities are often viewed as Ivory Towers, insular and protected from outside influences. Public schools also have this tendency to keep the broader community at a distance – when do parents come to schools? They come for open houses, parent conferences, and perhaps ad hoc events when the school district needs another bond, levy or financial initiative passed. ALCs are predicated on active engagement and parents would be in schools every day. Teachers would do their own internships in local business to align content with real world skills. Community groups would use school facilities to promote community action events and initiatives. And, all of these activities would be supported by digital innovations to make and sustain these 'connections.' Schools must do a better job of inviting everyone in to the classroom.

Experience

Experience is cumulative. Students, teachers, parents, counsellors, business leaders, government personnel, social service agencies all bring extensive experience to the community. In essence, the community is its own meg-repository of knowledge and strategies for the community. This is an infinite resource for all member of the community. ALCs recognize this invaluable repository for empowering communities to empower schools and personalized learning across the community. Moreover this experiential repository is reciprocal – it can be exchanged and re-distributed among all stakeholder groups in the community. Communities for 21st century schools must tap this experience repository – for formal education and for community development.

Empower

The core foundation of building ALC's is to create a 'community for innovation' (Olcott, 2014). Innovation is not synonymous with technology. Innovation, in fact, exists along a continuum that includes much more than just hardware and software (Rogers, 2003). Innovation is thinking and creativity. Innovation is new policies, processes, procedures, curriculum, pedagogical practices and more. Moreover, using by-lines such as building a 'culture of innovation' or a 'culture of technology' is not only doublespeak – it is misleading to students, learners, and other stakeholders. ALC's are predicated on engaging the entire community in innovative ways of thinking – about everything, not simply technology.

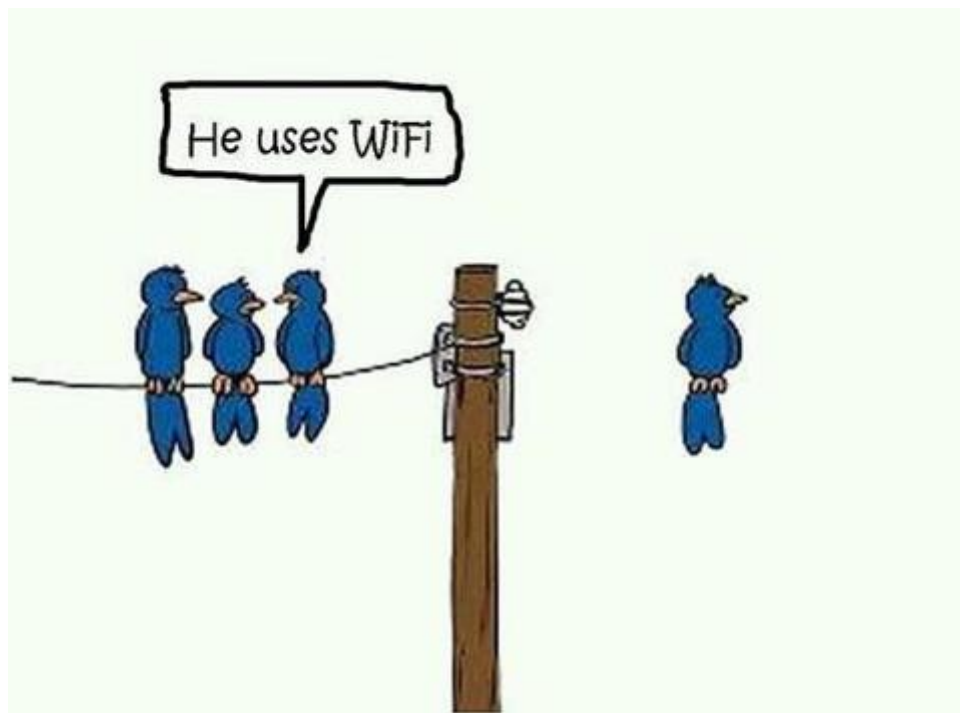


Figure 1.

Effect

Similar to experience, effects from learning are cumulative. The community repository of experience must be supplemented with evidence and data that demonstrate precision effects – effects of teaching on learning; effects of digital technologies and PLEs on metacognition of learners; effects of schools on community action initiatives; effects of business partnerships with schools; effects of parent engagement by active participation (not simply coming to Open House) in the educative process. Moreover, decision making at all levels, from the classroom to the mayor's office to the corporate CEO's beach house, must be embedded in a commitment to continuous quality improvement through performance based management – using data to make good decisions (Bennis & Nanus, 1985; Burns, 2010; Hickman, 2010; Yukl, 2013).

Emote

ALCs presume that the affective domain – the open and honest expression of emotions in the education process (teaching and learning) are as valuable as intellectual gains by students. Schools must engage students in the emotional context of being students, peers, citizens, and adaptive learners through the digital resources of the 21st century. Emotional health is an area that tends to be overlooked unless there is a problem – healthy expression of emotions, views, values, attitudes, and belief structures are an essential part of the educational process.



Figure 2.

Evolve

Transformation is evolutionary rather than revolutionary. ALCs suggest that transforming schools take creativity, re-assessment of traditional practices and approaches, a 'community for innovation,' collaboration, and the recognition that we are not preparing students for today's world – we are preparing students (and ourselves) for the 2030 world. We not only need to think outside the box – we need to take the risks to think that the box doesn't exist. The author was once asked who invented the mobile phone – this was in front of 500 people. I answered Gene Roddenberry. The woman who asked the question did not understand. I explained that the first mobile phone that I saw was Captain Kirk talking to Scotty aboard the

U.S. S. Enterprise ‘beam me up Scotty.’ There were no cellular phones when Star Trek hit the airwaves in the mid-1960s but they did exist in the imaginations of people and creators.

Efficacy

Ask any principal, CEO, university president, government leader or other leader this question: How do you reward your employees for failure? Most will escort you to the door without a return invitation. The rhetoric of innovation, imagination, creativity are politically correct sound bites – but actually engaging people in the creative process without adding the punitive or retributinal consequences takes real leadership and visionary capacity to see the forest through the trees. Does this mean every organization just lets people spend away the organization by trying every creative and innovative idea that pops up? No. What it does mean, however, is creating a ‘community for innovation’ where great ideas, great applications, and yes, great technologies can be created in a ‘community for innovation’ that taps the unlimited creative spirit across the community. How many great ideas and practices do we lose every day in business, government and education because people fear negative consequences for their creative talents?

Summary

Digital transformation takes more than technology. It will require a rediscover of leadership and putting innovation back in to the core of each leader. Building a community for innovation requires a synergy of the entire community – educators, government and ministry leaders, students, faculty, private providers, social service organizations, religious leaders, parents, and more. Indeed, what we should be developing with ALCs are ‘*communities for innovation*’ that collectively embrace innovation in all its guises and creative capacities (Olcott, 2014).

Digital technologies are not simply for use in the schools by teachers and students; nor simply a showcase for Open House and parent briefings on an ad hoc basis. They are a collective community resource. ALCs explore how students and teachers adapt to these new innovations, how geographic communities play an integral role in the deployment of these innovations, and how ‘flipped communities’ may serve as a catalyst for schools to leverage outputs by assuming new roles to create optimum educational, social and cultural impacts for community development. We have moved beyond flipped classrooms. ALCs are about ‘flipped communities.’ We invite you to get aboard the U.S.S. Innovation and take this journey towards StarDate 2030.

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LEARNERS – NOT SYSTEMS – ARE THE VALUE CREATORS

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Conventional approach to value creation

The high-quality course development process for eLearning has been often viewed as a value chain, which is tightly defined and structured, and covers various stages from needs analysis until evaluation. The value chain approach introduced originally by Michael Porter in the mid-1980s (1985), and the value chain approach could nicely capture the essential elements in businesses based on manufacturing.

The economic benefits of the design, production and delivery of effective eLearning solutions have often been based on the ideas of effective manufacturing and its economic parameters, as one of the economic promises of eLearning has been to alter the economies of learning “from handicraft to mass production”. The economic discourse of distance education and eLearning has adapted terms and ideas of the manufacturing metaphor, such as economies of scale and economies of scope (Morris, 2008) and cost effectiveness and efficiency (Kasraie & Kasraie, 2010).

Based on the Porterian thinking, the operational goal of the eLearning providers have been seen to be to streamline the actual eLearning course production process by using the well-tuned consecutive steps of needs analysis, course design, course delivery, course interaction, and assessment. The value has thus been understood to stem from efficient course provision and effective facilitation of various interactions. Furthermore, the Porterian thinking has highlighted, that entities must examine each activity in the value chain to see if there is a competitive advantage to concentrating and/or coordinating the activity (Porter, 1986).

However, another way of creating value is through co-creation, through interaction among faculty, learners and the larger society. Also value should be viewed from a new perspective - value should be measured only as direct learning outcomes, but also as participation and involvement of the learners, co-learners, teachers, and supporters. We claimed together with my colleague Tom Smith in 2012 in our conference paper “Value Co-Creation in Online Education”, that the novel idea of creating value in online education is particularly important in courses of professional development (Auvinen & Smith, 2012), and this discussion was widened by George Moerkerke in his paper at the EADTU conference in 2014 (Moerkerke, 2014).

Changing value creation mechanisms

Some ten years ago the understanding of value creation took new, important steps, which are also essential in understanding the value creation mechanisms of eLearning courses. The new discourse of service-dominant logic (SDL) challenged the conventional thinking of value creation. The main argument of R.F. Lusch and S.L. Vargo in 2004 was that services behave differently from goods (and “goods-dominant logic”) and thus the mechanisms in producing and consuming services do not follow the mechanisms of physical goods (Vargo & Lusch, 2004). Thus also the value creation happens differently – not by the effective production and provision mechanism only, but rather by the value creation within the interface of the producers and customers. If Porter in his work in the 1980s could capture well the value creation mechanism in manufacturing industries and describe it with the value chain conceptualization, so Lusch and Vargo were able to widen the understanding of value creation mechanisms and emphasize the role of the customers in the value creation process.

The value co-creation was emphasized also by C.K. Prahalad and Venkat Ramaswamy in their seminal work of co-creation also in 2004 (Prahalad & Ramaswamy, 2004). Their main argument was that the market had been becoming a forum for conversation and interactions, and that the management and facilitation of this dialogue was the key in value creation process. Their view of the market means that the market had been becoming instead of a seller-buyer-market rather the environment for co-creation of value.

Furthermore, they defined that the key building blocks for the interaction between users and providers of services could be defined as dialogue, access to important information and resources, risk-benefit assessment by the users, and transparency of work and working methods. Their essential argument was that the dialogue focuses on issues that interest both the users and the providers; that there had to exist a forum in which the dialogue can occur; and that there were clear rules of engagement that make for an orderly, productive interaction (Prahalad & Ramaswamy, 2004). In particular, the aspect of “dialogue” is the essential element for learning in all its forms. In the academic discussion of the nature of services, it has been emphasized for many years that the users participate to the actual service production. This is often mentioned also as key characteristics of services (Grönroos, 2000).

Furthermore, access is also critical – access covers information and tools, but as Prahalad and Ramaswamy note, access can also transform the capacity for self-expression. Risk is understood to refer to the probabilities of harm and disadvantage for the user and the users’ appropriate means to assess the risk and work according to his/her best interest. And finally, transparency means that the working methods and the working principles of operations are visible for the users. (Prahalad & Ramaswamy, 2004)

Changing learning metaphors

The understanding of value creation as a process as well as the understanding key actors of value creation has been developing during the last ten years, but so has also the understanding of learning been entering new areas. In contemporary environment, adult learners are highly self-directed, as learning does not only take place in institutions, but everywhere, during the course of one's whole life in a number of different episodes, in learning communities and social networks, using social software and individually compiled contents (Ehlers, 2008).

Ulf Ehlers has been summarizing the key alterations in learning metaphors to the five essential trends, which are:

- from reception of learning content to active participation of learners;
- from inspecting the learning outcomes to active reflection;
- from planning education and training for the learners to planning education and training by the learners;
- from “push” of learning content towards “pull” of learning content;
- from individual intelligence domains to collective intelligence domains (Ehlers, 2008).

The elementary trend in the changing learning approach is the active participation of the learners to their learning process in every stage.

One interesting trend is the growing importance of peer-produced eLearning content, which in practical terms shows the power of the co-creation of value. Not only are the learning individuals essential as learning content providers, but also the importance of the peer groups is growing. In eLearning content area the impact of the peer group is essential, as the members of the peer groups can take different roles and as the members of the peer groups also possess different competences. The peer group members can be willing to share materials, re-edit existing ones and create knowledge and they should have a clear and explicit objective to support each other in order to grow together (Auvinen, 2009). The “group emphasis” is also highlighted in the discussion of “informal learning” – e.g. Jay Cross states that informal learning is strongly fuelled by the communication of peers and that this communication is the critical element in informal learning (Cross, 2006).

The modern eLearning environment also enables the learners to utilize available resources and visualize their competence e.g. by ePortfolios and collaborative project work. The eLearning environments provide usually such fora, where not only the users and the providers can meet, but also the users can meet with another. The importance of peers in modern contemporary learning is growing – not only due to the growth of user-generated content, but also due to the importance of various peer networks. Vital examples of peer networks, which can also be of great importance for learning, are communities of practice (Wenger, 1999).

The learning provision directed to professional development is, in particular, in major changes. Professional development opportunities are surfacing in social networks. An elementary part of professional communication and problem solving is taking place in the

online world using the mechanisms of “crowdsourcing” and thus the “wisdom of the crowds”. Contemporary authors, such as James Surowiecki (2005) and Charles Leadbeater (2008) have shown that “many are wiser than few” and that the knowledge creation and knowledge assessment processes in the Wikipedia age are different than former knowledge creation and assessment processes.

eLearning and value co-creation

As stated earlier, the planning and implementation of eLearning courses, in particular in professional development, has relied strongly on the Porterian value chain approach. This approach has had its clear benefits by providing clear consecutive phases of work, and systematic method in planning and implementing successful eLearning courses. However, the Porterian thinking in eLearning belonged to a time when the learning environments were closed and the faculty was providing – even dictating – all the learning resources. In the contemporary eLearning environment, the learners have access to a wide selection of various learning resources and options and also a wide array of various eLearning providers.

In conventional approach to distance education and eLearning, three major methods of learner interaction have been emphasized: learner interaction with learning materials and learning resources, learner interaction with teachers, tutors and supporters, and learner interaction with other learners (see e.g. Moore & Kearsley, 2011). The importance of other learners – co-learners, if you like – is increasing rapidly especially in professional development courses. Thus the eLearning courses should be regarded as arenas for value co-creation with learners. Thus the value is not created by effective provision and planning, but rather through a continuous dialogue with the learners. Other learners – co-learners – are becoming important actors in the value creation process. The role of the faculty is changing and becoming more challenging, as they become a part of on-going and ever evolving dialogues.

Value co-creation in eLearning is a challenging approach. Many contemporary examples of the utilization of “wisdom of the crowds” and thus value co-creation by numerous users show that such work must be well planned, facilitated and supported. The modern encyclopaedia Wikipedia is a solid example, and its development shows also that value co-creation “does not just happen” (Tapscott & Williams, 2006; Lih, 2009). Value co-creation requires thorough planning, organization, implementation and continuous improvement.

However, for effective value co-creation there are a number of good mechanisms and tools already available. For instance, the learners within an eLearning can develop their own wikis, which can create a sustainable resource for professional work also after a single eLearning course. The work with ePortfolios can bring also novel energy to value co-creation, if the content of ePortfolios can be shared. The developing mechanisms of eLearning content peer production are provided interesting novel opportunities for content development. The easy opportunities to set up own communities-of-practice can be attractive.

Conclusions

We are moving in eLearning – in particular, in courses of professional development – from closed learning environments towards open learning environments. The learners are able to identify, assess and utilize good learning resources and content from the wide provision on the Internet. Simultaneously the role of the faculty (including the teachers, tutors and learning supporters) in professional development is also changing, and their new key role is the facilitation of learning, knowledge creation, assessment and sharing.

At the heart of the new strategies for eLearning in professional development is the understanding of value creation: is value created by a well-planned and well-controlled educational provision or is value created with the users in continuous communication.

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DIGITAL LEARNING IN IRISH HIGHER EDUCATION: INTEGRATING STRATEGIC AND LEADERSHIP PERSPECTIVES INTO A ROADMAP FOR DIGITAL CAPACITY

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Introduction

Digital learning finds its way, as if by stealth, into the mainstream of higher education. As educators, however, we are aware of a persistence of traditional teaching and assessment practices. Taking innovative and potentially transformative pedagogical practices to scale is a well known but poorly addressed challenge. Innovation in digital learning spins out further innovation as devices, learning platforms, digital tools and resources proliferate and are selectively adopted or promoted by a cadre of enthusiastic, curious and committed academic practitioners, well versed in technology enhanced learning. Bottom up approaches to digital learning, however, often give rise to an unsustainable multiplicity of practices across disciplines and faculties, usually layered on top of existing practices rather than replacing them. On the other hand, top down institutional initiatives, intended for mainstream adoption, are often seen by pedagogical innovators as driving conservative or constraining decisions about technologies, platforms and learning spaces. Addressing this bottom-up, top-down dilemma is today's key challenge for innovation and modernisation of higher education. This paper looks at one facet of this challenge, and how the perceptions of those in academic leadership roles are informing discourse and strategy development for digital learning in Irish higher education.

Digital Capacity and Enhancing Teaching and Learning in Irish Higher Education

The National Forum for the Enhancement of Teaching & Learning in Higher Education (Forum) was established in 2012 with a remit to "enhance the quality of the learning experience for all students... be they full-time, part-time or flexible learners"¹. The Forum fulfils both an advisory role to the Education Minister and the Higher Education Authority (HEA, the funding body for higher education) and an implementation role in relation to a range of activities for which it has devolved responsibility. In its work, digital learning and staff professional development in digital pedagogy are contextually centred in a wider

¹ See <http://teachingandlearning.ie> and the work plan for the T&L Forum <http://teachingandlearning.ie/priority-themes/work-plan-201314>

pedagogical discourse, and developing ‘Digital Capacity’, defined to be “the skills, competences and attitudes that enable people to work, live and learn in a complex world that is increasingly digital” (National Forum, 2014, p.5) is one of five integrated thematic action areas, all of which have an overriding goal of delivering outcomes of scale and sustainability. A 360° perspective has been adopted in further work leading to the development of a ‘Roadmap for Enhancement in a Digital World 2015-2017’ (National Forum, forthcoming), a blueprint for the integration of digital learning and digital pedagogy consistently and at scale across the higher education sector as a whole, informed equally by students, academics as teachers, learning support staff and academics in senior/strategic roles.

Strategic and Leadership Context

If academics as teachers provide a bottom-up perspective from the frontline of engagement with students, the counterbalance can be found among their peers who have moved from the frontline into cross-institutional roles aligned with faculty leadership, academic management, academic quality assurance, learning innovation and strategic planning. Academics in these roles can provide unique insights into the challenges of scale and sustainability of digital learning innovation. On the one hand, with their influence over strategic direction, budgets and the seed funding of innovative pilots, they can create an enabling environment. On the other hand, the imperative to manage scarce resources and to ensure that institutional reputation and quality remain demonstrably on a sound footing makes it difficult to choose between competing demands for up-scaling, mainstreaming or simply sustaining successful pilots. Staff in these roles embody the bottom-up, top-down dilemma and the development of the Digital Capacity Roadmap provided an opportunity to discuss this with them on a one-to-one basis, using a semi-structured interview approach and the Chatham House rule, under which frank comments could be elicited and summarised without attribution. Interviews with a total of 24 academics in senior/strategic roles were conducted in May 2014.

Conducting the interviews at that time allowed for a comparison to be made with another source of insights into digital capacity building. In early 2014, in the context of the national strategy for higher education, HEA introduced performance-based funding for higher education institutions (HEIs). Underpinning this approach is a ‘Mission Based Performance Compact’ (Compact), instituted between HEA and individual HEIs, covering the full range of HEI activities, including the environment for teaching and learning². In all, 26 Compacts have been published, covering publically funded HEIs in Ireland (including 7 Universities, 14 Institutes of Technology and 4 Teacher Education Colleges discussed in this paper). Compacts can be regarded as statements of strategic positioning and intent, in response to the national strategy for higher education.

² See <http://hea.ie/en/policy/national-strategy/higher-education-system-performance-2014-16>

Framework for Analysis

The approach taken by Trowler, Ashwin and Saunders (2014) provided a conceptual framework to underpin the analysis of strategic positions and measurable targets documented in HEI Compacts and to relate these to the interviews with academics fulfilling senior/strategic roles. In their model, enhancement extends from incrementalism (reform agenda) to reinvention (transformational agenda), see Figure 1.

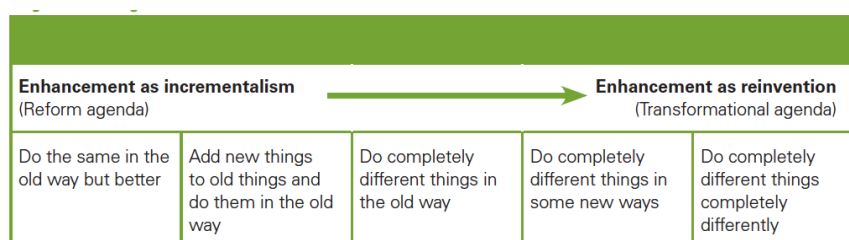


Figure 1. Enhancement (Trowler et al., 2014)

The framework offered a way to understand practices as they are experienced and understood by the senior academics interviewed. Questions underpinning the interviews with academics in senior/strategic roles were designed to elicit their perceptions of particular but open-ended issues. These issues are summarised in Table 1.

Table 1: Questions for Academics in Senior/Strategic Roles

Issues explored with Academics in Senior/Strategic Roles
<u>Concerns and aspirations</u> for the higher education sector when it comes to enhancing teaching and learning in an increasingly digital age.
<u>Opportunities</u> for developing a <u>sectoral approach</u> to building digital capacity in Irish higher education.
Examples of practice either nationally or internationally?
<u>Specific actions</u> in support of digital capacity building that are tangible/possible and that are realistically achievable within the current challenging operating environment at either INSTITUTIONAL or SECTOR levels.
<u>Challenges</u> : Specific digital capacity building actions that may be desirable/urgent but difficult to undertake at this time?

These questions relate closely to the categorisation of practices devised to analyse the HEI Compacts, but the outcome of this analysis was not known in advance by the participants in the interview process, thus maintaining the independence of both processes and the ability to draw comparisons from their respective findings.

Categories were organised around a spectrum of digital learning innovation activities of *potential scale* in Irish HEIs, see Table 2. Five categories were identified, reflecting what might be regarded as modest reform of traditional practices to activities that would represent new and more transformative territory for HEIs. Other categories were also identified, including more general supports for learning and student wellbeing, capacity issues, e.g., the extent of staff professional development activities, supports for Technology Enhanced Learning (TEL) and the digital infrastructure itself. Finally, we identified emerging practice areas including Open Education Resources (OER) and Learning Analytics.

Table 2: Institutional Practices

	Category	Description
Reform ↓	Additionality	<u>Additionality</u> for campus-based students through Virtual Learning Environment (VLE)/digital platforms/digital resources
	'Blended'	<u>Extending/modifying the campus-based paradigm</u> : intentions to redesign programmes to incorporate hybrid or blended learning elements
	New Audiences	<u>Reaching new audiences</u> : extending access to existing or new accredited programmes through part-time/online/hybrid delivery
	Inter-institutional	<u>Inter-institutional collaboration</u> to design and deliver programmes
Transform	International	<u>Online International Delivery of Programmes</u>
Support	Non-academic supports	General supports for student learning and welfare (<u>explicitly digitally-supported</u>)
Capacity ↑ ↓	Staff to support TEL	Educational technologists and designers embedded within departments or operating through a centralised support unit
	Academic Staff CPD	All references to professionalisation of the teaching role of academics, including aspects pertaining to digital pedagogy
	TEL Infrastructure	Indications of proposed investment/development of facilities
Emerging ↑ ↓	Open Education Resources	Plans to develop and/or incorporate Open Education Resources (OER); policies for OER
	Learning Analytics	Indications of intentions to deploy learning analytics

While many innovative digital learning projects and initiatives are evident in Irish HEIs, it has not been easy to assess their overall impact or to place them in the wider context of institutional strategic and leadership positions. By juxtaposing the interview process and the analysis of Compacts, it has been possible to gain an initial insight into how a range of innovative practices are viewed top-down.

Insights from Interviews with Academic in Senior/Strategic Roles and HEI Compacts

Interviews with Academics in Senior/Strategic Roles

The interviews provided a rich and complementary picture of the day-to-day reality of fostering learning innovation in Irish HEIs. Dominant themes to emerge included strong support for academic staff CPD and for the professionalization of the teaching role and for collaborative HE sector level actions to deliver the required CPD. Much emphasis was placed on what was described as 'appropriate' integration of digital technologies, but there was agreement that current approaches are for the most part conservative (*'doing the same in the old way but better'*). While learning innovation (digital) is taking place and bottom-up innovations are facilitated, there is little appetite as yet for strategic (top down) initiatives. There is broad agreement, however, that matters related to digital or online learning and digital capacity generally should be brought systematically into the mainstream of institutional quality assurance processes.

Concerns were also voiced, particularly in the context of the severe budgetary, staffing and demographic pressures currently being experienced by all Irish HEIs. These include sustainability: the ability to fund on an ongoing basis the necessary expansion of ICT networks/services/platforms; managing the expectations of the ‘digital student’ (Beetham & White, 2014) and scalability: current staffing levels for essential support staff (e.g., educational technologists) are too low to allow for any step change in the level of digital learning integration or for the scaling up of already established pilots. Some concern was also expressed about students’ digital competence. Experience indicates that this cannot be assumed. It is insufficient just to be ‘digital’. Also noteworthy is a widespread perception of poor/limited use of VLEs (often used merely as repositories for very basic content). At the very least, it was acknowledged that the evidence base is poor when it comes to understanding the extent and depth of VLE usage. Questions of organisational culture and change were also referenced as challenging. For example, ensuring consistency of the student experience can be a problem in a *laissez-faire* context where some staff intensively develop digital approaches and others do not. Furthermore, the culture change at faculty level that is required to integrate the skills of educational technologists to support course design and development is seen as a significant obstacle.

Ultimately, the view from staff in senior/strategic roles is optimistic, but with wide agreement that clarity is urgently needed about the overarching vision and goals for digital learning in higher education nationally. Current initiatives, while valuable, are regarded as fragmented, piecemeal and for that reason often unsustainable. The current stage of development in Ireland, albeit with its particular national nuances, largely reflects a European pattern reported by Gaebel et al. (2014) in a survey of 237 HEIs, noting for example that 77% believe that digital learning “*changes the approach to learning and teaching, but also that it takes time to introduce*” (p.44).

Institutional Compacts

Based on the categorisation in Table 2, HEI Compacts were analysed, and references to aspirations or intended actions were noted as ‘mentions’. Where specific, measurable targets were identified, these were separately noted. The resulting analysis was tabulated and presents a snapshot of the relative importance of individual categories of digital learning innovation (as seen from an institutional strategic perspective). The gap between ‘mentions’ and ability to set corresponding ‘targets’ also becomes apparent. Figure 2 compares ‘mentions’ and ‘explicit targets’ for the 25 HEI Compacts analysed.

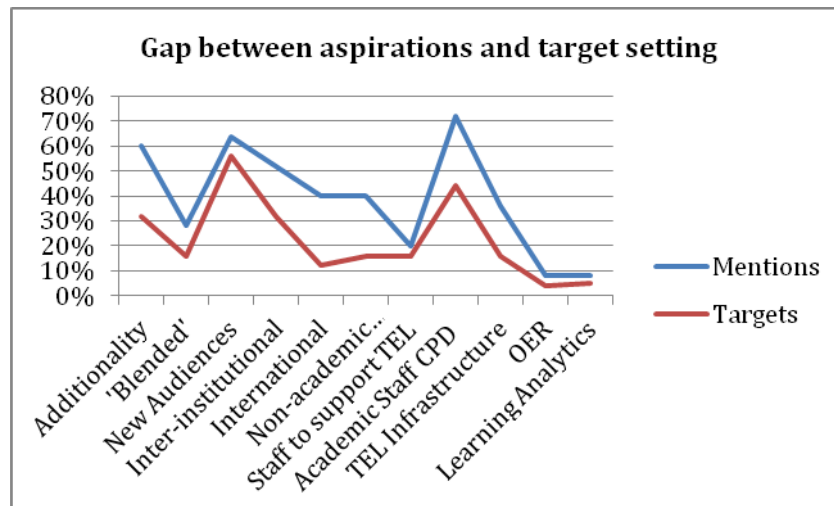


Figure 2. Gap between aspirations and target setting

What is evident is the gap that exists between intentions and the ability of HEIs to attach explicit targets to them for the period covered by the Compacts up to 2016. This may reflect uncertainties about resources in a higher education sector under severe financial and demographic pressure, or a lack of clarity about the specific actions that might be required to turn aspirations to reality. For example, where aspirations are high and targets align with aspirations, we can infer that HEIs agree on two things: the importance of the particular aspiration **and** that there is a clear understanding of the nature and feasibility of that aspiration. This is evident, for example, in the case of **New Audiences**. Mentions or aspirations are at a level of 60%, and more than 50% of HEIs attach explicit targets to these aspirations. For the most part, targets for new audiences relate to postgraduate and professional education. By far the greatest level of agreement, at 70% of HEIs, is on the importance of **Academic Staff CPD**; however only 40% of institutions have been explicit about their targets in relation to this. Conversely, where aspirations are low and targets are similarly aligned, we can assume that this category is not regarded *at this time* as a strategic priority, for example as can be seen in the case of **OER** and **Learning Analytics**. There is no doubt that academics in a number of Irish HEIs are active in international research and development in these fields, but the strategic question of mainstream integration along with the ethical and pedagogical ramifications do not yet appear to have been considered by HEIs. The category **International** is concerned with online delivery of programmes to an international audience. While moderate interest is evident, target setting is confined to just 3 HEIs. At face value, this seems surprising, but may reflect the relatively high barrier (competences, organisational structure and costs) associated with successful entry to the international online education market.

What is surprising is that **Staff to support TEL** appears to be a low strategic priority, given that a majority of HEIs are already providing some level of such support, up to and including 'Learning Innovation Centres' in the larger institutions. This raises a question as to the role of such supports, whether they are primarily geared towards enabling small bottom-up initiatives, or whether more strategic objectives (including actions of scale) are to be pursued.

Digital Learning in Irish Higher Education: Integrating Strategic and Leadership Perspectives into a Roadmap for Digital Capacity

Jim Devine, Terry Maguire

Their relative absence from the Compacts suggests the former. Categories covered by **Additionality** and **'Blended'** represent, respectively, moves towards development of platforms/VLEs to support campus-based students or a hybrid experience with some elements fully online ('doing the same in the old way but better' and 'adding new things to old things and doing them the old way' in Trowler's parlance). These receive relatively few mentions and target setting appears to be the exception rather than the norm. It is possible that HEIs regard such developments as evolving incrementally from the bottom-up and therefore not relevant to strategic dialogue. A more nuanced perspective is evident when findings for the higher education sector as a whole are disaggregated to show the profiles of component parts, Universities, Institutes of Technology and Teacher Education Colleges, see Figure 3.

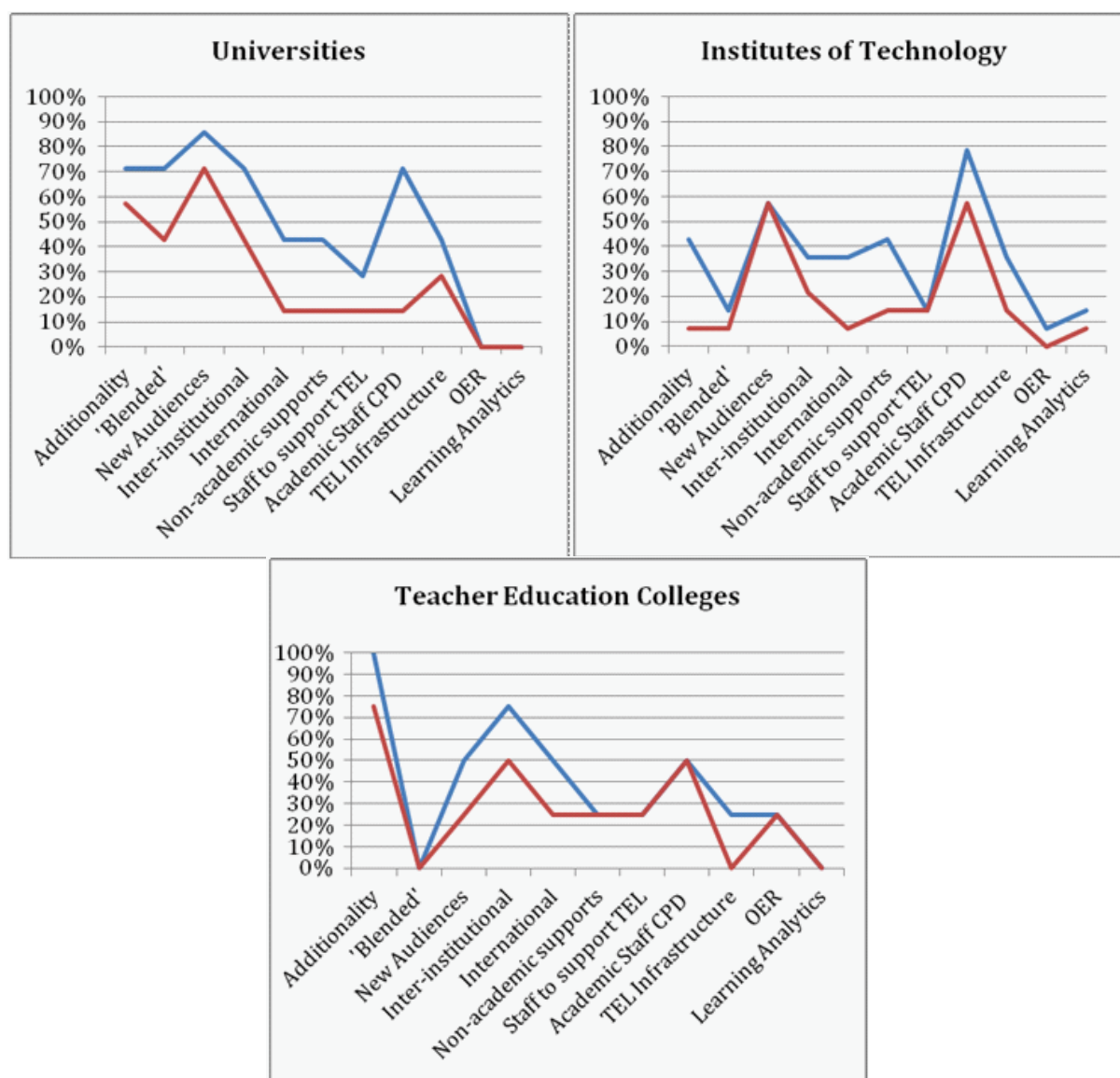


Figure 3. Profiles for different HEI types

We can see, for example, that universities show a high level of interest in reaching **New Audiences**, matched by a level of confidence in target setting. Institutes of Technology, on the other hand, appear to display particular strengths in **Academic Staff CPD** and in target

setting to achieve goals in this area. Teacher Education Colleges show a particularly strong interest in **Additionality** in terms of how they deliver their on-campus programmes, but this does not appear to extend to the next stage, i.e., **‘Blended’** approaches with inherently greater flexibility. Given the significant policy interest in modernising schools and the teaching profession, this initial finding points to a need for further investigation, if we are to expect future teachers to embrace flexibility in their own practice. Teacher Education Colleges also display a strong interest in Inter-Institutional collaboration.

Feed Forward to Developing the ‘Roadmap’

Insights from academics in senior/strategic roles together with those harvested from institutional strategic mission-based Compacts combined to provide one pillar of the stakeholder consultation required to underpin the multi-stakeholder ‘roadmap’ for building digital capacity. This roadmap is founded on four integrated recommendations, see Figure 4, requiring implementation in tandem and in balance.

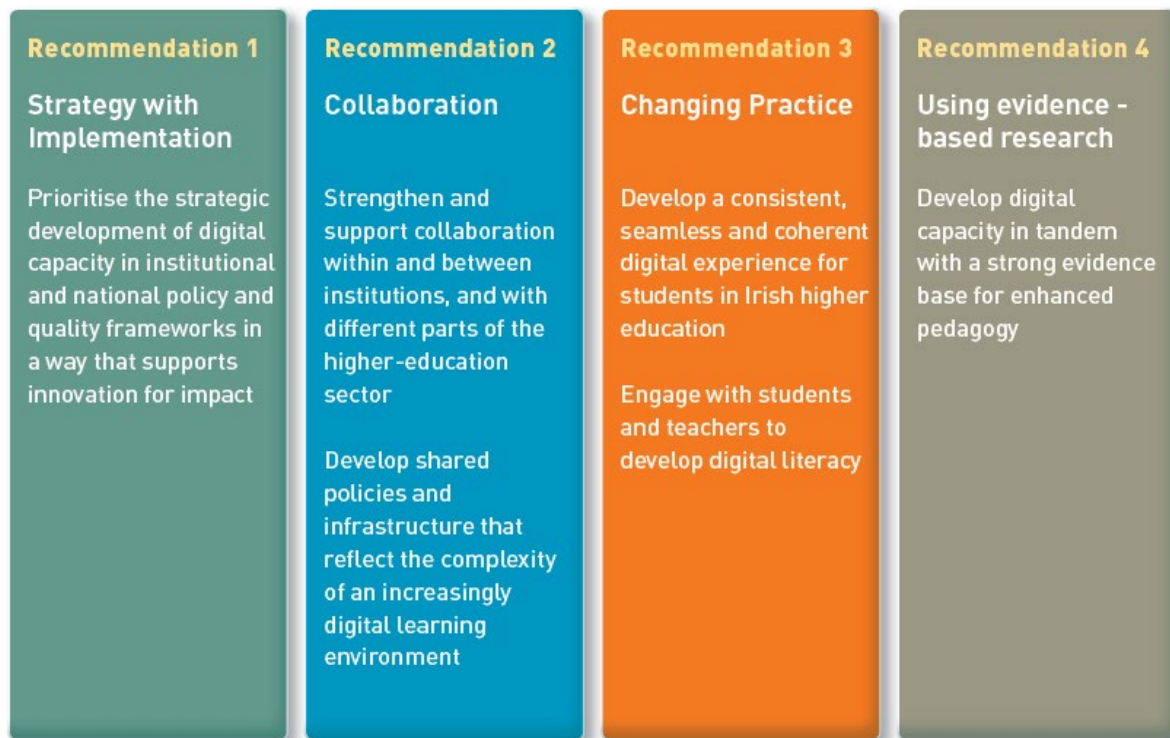


Figure 4. Integrated Recommendations for building Digital Capacity

Successful implementation implies an understanding of the interdependency of all stakeholders, including those in the national funding and quality agencies responsible for higher education. Recommendation 1 is critical to achieving scale and sustainability and responsibility for leadership rests firmly with academics in senior/strategic roles. Under this recommendation, priority actions include making explicit within institutional strategies the responsibility and structures to support the development and embedding of digital capacity; enhancing the national policy infrastructure to ensure that they are effective enablers of digital

capacity building; and developing a co-ordinated, multi-level approach to fostering digital literacy, skills and confidence among students.

Conclusion – Implementation for Impact

Informed, concerted effort is required to embed quality assured digital learning consistently and at scale within Irish HEIs. An extensive consultation process delivered the first draft of the Digital Capacity roadmap in 2014 and this work has now been further developed, resulting in the extended ‘roadmap for enhancement in a digital world’, that is strategic in its vision and focus, but grounded in actionable implementation items and guidelines about how to address them. The voice of academics in senior/strategic roles is fully integrated in this plan, with their particular capacity to influence changes in scale, organisational culture, quality and assessment of impact.

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STRATEGIES OF TECHNOLOGY USAGE IN LIFELONG LEARNING PROGRAMS

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Lifelong e-learning

Through the change from industrial to information society, knowledge has become one of the most valuable resources. The half-life of knowledge decreases continuously, which has a strong impact on education policy. Individuals have to learn lifelong [1]. For graduates and professionals, institutions of higher education offer many possibilities of academic continuing education. Besides research and academic teaching, this task field has already been established as an equal main task at German institutions of higher education [2]. The use of digital media within this field provides a lot of advantages towards traditional in-class-training. Because of the time- and place-independence of digital education it is possible to reach new target groups, like full-time employees or heavily place bounded persons [3]. Interactive media and the internet can deliver advantages for learning processes: they make learning more efficient and support a more motivational and successful way of learning – as far as they are used sensible [4]. Furthermore there is an unused advantage of motivation behind using digital media to improve learning and teaching [5]. *But how are digital technologies used in education programs at institutions of higher education?* This article examines the use of digital technologies in the field of continuing education at Saxon institutions of higher education. Saxony is a state within Germany with different institutions of higher education – e. g. from small institutions with less than 1000 student until institutions with more than 30.000 students – and with a very good e-learning infrastructure. Through this in almost all institutions of higher education in Saxony the basic requirements were created for a sustainable implementation of e-learning in academic teaching and academic continuing education [6].

In 2013 all academic continuing education programs at Saxon institutions of higher education have been analyzed to get an overview about the status quo of digital media usage within such programs [7]. The results of the program analysis (N = 404) show, that there are 345 part-time programs but surprisingly only 54 media based programs among all academic continuing education programs. This makes it interesting to ask the stakeholders of these programs, which media they use and which intentions are behind this use (strategies) to get to know the real status quo and to support stakeholders adequately. To get a detailed picture regarding

media use, however, it is necessary to examine individual offers or stakeholders. This objective provides the starting point of an online survey, focusing the following questions:

- Which technologies are used in academic continuing education programs?
- What are the strategic reasons for using technologies?

Furthermore we are interested in the different e-learning strategies between public and private institutions or universities and universities of applied sciences. *Do institutional affiliation and the position of the respondents or the educational program have influence on the reasons for the use of internet technologies? If yes, which one?* By knowing these differences, the support for stakeholders can become more equal and help to fix lacks to improve the use of internet technologies.

Methodology approach

As mentioned above the study should help to answer questions about the *internet technologies* stakeholders use in their academic continuing education programs. The online survey was send to 631 persons, who participate in the field of continuing education at Saxon institutions of higher education. To find out why stakeholders use internet technologies they got a list of eleven strategies. Each internet technology opens different kinds of possibilities. Based on our own research and experiences with supporting projects of academic continuing education, we worked out eleven strategies of using internet technologies [8]. They got the possibility to agree on a scale from *very important* to *not important* with the opportunity to give a *don't know*-answer. For the analysis of the strategies, 150 data sets have been used. This are 86.7 percent of the cleaned data set ($n = 173$). The 23 missing data sets are eliminated by a list-preclusion of missing values. In this case it is the best method, because after the preclusion still all variables are quantitative equal and the data set is with 150 big enough for all necessary tests.

Empirical findings

In the following we present the striking results of the online survey. At first we have a look on the different kinds of internet technologies, which stakeholders use and their way of using them in their academic continuing education programs.

Internet Technologies

First of all, we wanted to find out which internet technologies are used in different education programs. Figure 1 shows the different kinds of internet technologies and their use within the programs.

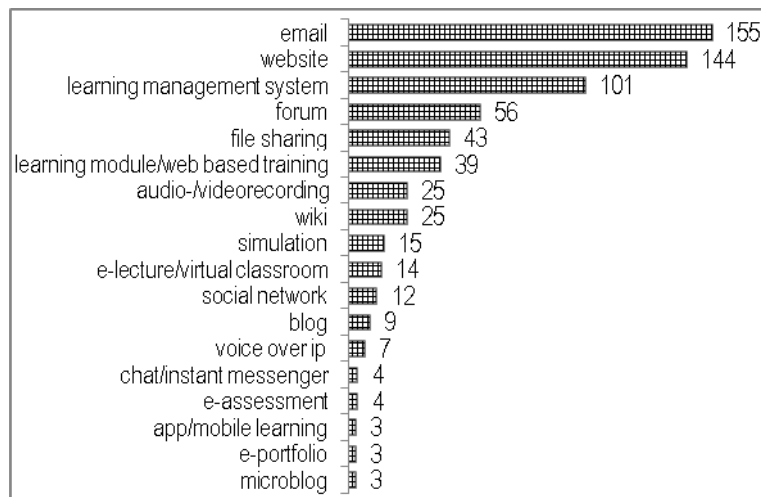


Figure 3. Frequency of using internet technologies (n = 173, multiple selection possible)

Surprisingly not all (155 of 173) use emails. 144 programs have their own website and 101 use a learning management system. The remaining technologies are used by less than one third of the programs. It is not possible, to equate email and website with e-learning. These are often used for purely administrative purposes. For us, e-learning means, that technologies are used in educational processes to follow pedagogical considerations. For what purpose technologies have been used cannot be concluded, however, it can be stated that about 60% of the respondents use technologies that have didactic added values. It also became clear that innovative technologies (e.g. e-portfolio, e-assessment) are rarely used in the area of academic continuing education.

Strategies of technology use

In the findings the relevance of the individual objects are obvious. In the second step of the analysis key factors behind the items should be identified, in order to examine their relations with other variables. For this purpose a factor analysis has been performed (see Table 1).

The results of the factor analysis allow the following illustrations to make the common variables better visible. Three different main strategies of technology usage have been identified:

- *Institution (factor 1)*: Focus on resources, strategies and capacities of the institution. Technologies are used to follow institutional strategies, to save resources or expand capacities.
- *Participants (factor 2)*: The participant focus makes stakeholders concentrating on the participant needs. Nowadays every individual has to learn lifelong, for which reason time- and place-independent learning becomes more and more essential. Internet technologies are used to allow flexible learning or individualise academic continuing education programs.
- *Visibility (factor 3)*: Focus on the educational market. Technologies are used to improve opportunities of marketing activities, which implies addressing new target

groups or improving the image and visibility of academic continuing education programs.

Table 1: Three-factor-solution of E-Learning strategies (n = 150)

item-variable	item	component		
		1	2	3
v_9I1	reach new target groups			.767
v_9I2	enlarge the amount of participants	.720		
v_9I3	save resources (money, staff, time)	.662		
v_9I4	expand didactical possibilities	.798		
v_9I5	follow institutional strategies	.560		
v_9I6	respond to participants needs		.722	
v_9I7	permit time- and place- independent-learning		.805	
v_9I8	respond to individual needs		.572	
v_9I9	improve image			.775
v_9I10	better reuse contents		.678	
v_9I11	trial new ideas	.832		

The three main strategies have been analysed in the context of different characteristics of the subjects. In this way, it is possible to find out, if attributes like institutional affiliation have impacts on using technologies in academic continuing education programs. The statistical research has been performed by a variance analysis (ANOVA), with the three main strategies as dependent and person-based attributes as independent variables. In the following some striking findings are presented.

Strategies in the context of institutional affiliations

We suppose that different strategies are also influenced by the belonging of programs to a university or university of applied sciences. In Germany are 143 universities of applied sciences and 105 universities [2]. We suppose differences concerning the strategies pursued by universities of applied sciences and universities, because they have different organizational, administrative and didactical structures. Universities of applied sciences offer shorter studies, more practical and less scientific input. Figure 2 shows the relation between these different affiliations.

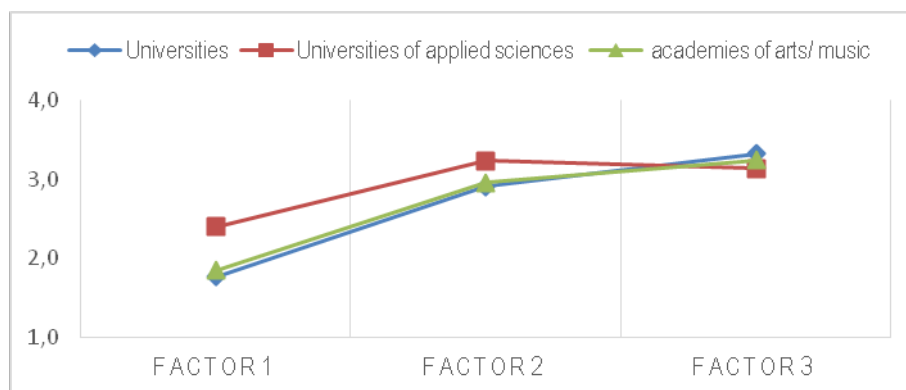


Figure 2. Relation between strategies and different affiliations (n = 150)

The graphic illustrates the relation between strategies and institutional affiliation. It is clear that marketing issues (factor 3) are very important for all participants, regardless of which institution they work for. It is also visible, that factor 1 (institution) and factor 2 (participants) are much more relevant for members from universities of applied sciences. As the statistical analysis shows the differences among the groups according factors 1 are highly significant (0.000).

In Germany, institutions of higher education are mostly financed by public funding. It is interesting to see, whether there are differences concerning their pursued strategies via the use of internet technologies, because private depends in contrast to public institutions very much on tuitions. Internet technologies are probably used to attract potential students. The following Figure 3 is showing this differences.

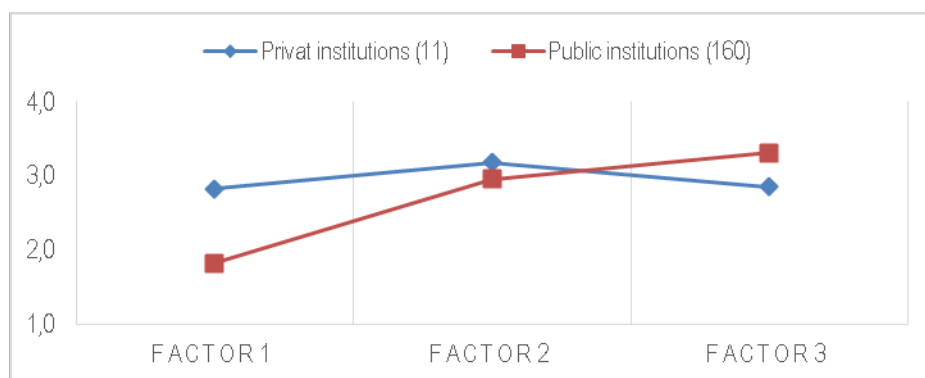


Figure 3. Relation between strategies and different institutions (n = 150)

As Figure 3 illustrates the importance of the strategies differs in dependence of the financing. The comparison of private and public institutions shows, that private institutions are stronger focused on institutional goals. It is essential for these to deal efficient with resources or to increase teaching capacities. These differences within factor 1 are highly significant (0.000). No significant differences could be found in the other categories.

Strategies in the context of education programs

Academic continuing education programs have different internal structures, curricular aims and lead to different academic degrees. We distinguished study programs, certificate programs and educational modules. Modules are the smallest unit. They usually include a few days and lead to a confirmation of participation. A certificate is based on a performance of the participant e.g. an exam with a positive result. Mostly such certificate programs include different educational modules. If it is a full study program, than the participants reach an academic degree (bachelor or master). One point of interest was to find out, if and in what extend the strategies of using internet technologies. Figure 4 presents these differences.

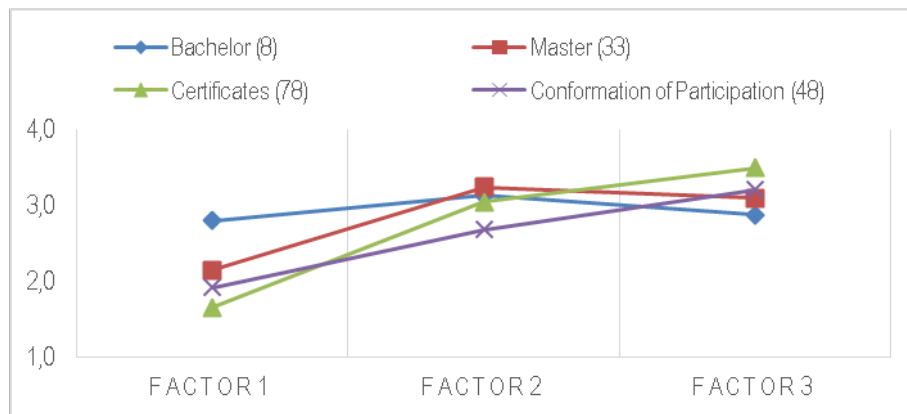


Figure 4. Relation between strategies and different programs (n = 150)

As Figure 4 indicates, institutional aims (factor 1) and participant focus (factor 2) are more relevant for study programs, no matter if they lead to bachelor or master degrees. Marketing purposes (factor 3) are mostly focused by certificate programs. As we could proof by an ANOVA, all findings are highly significant (factor 1 = 0.000; factor 2 = 0.002; factor 3 = 0.010).

Strategies in the context of professional positions

Does the reason for using internet technologies in academic continuing programs depends on the professional position of the involved people? To answer that question, the three factors have been set into a relation to the academic degree of the propositi via ANOVA. We distinguished professors, postdocs, master graduates and bachelor graduates as visible in the following figure 5.

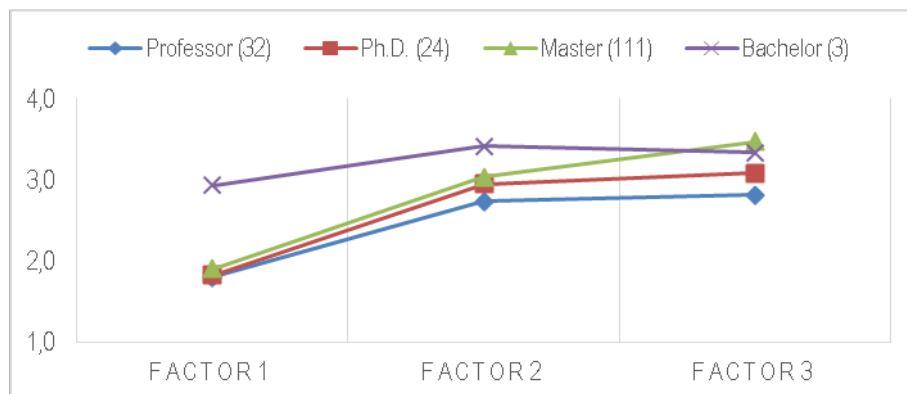


Figure 5. Relation between strategies and different professional positions

As Figure 5 illustrates, propositi with bachelor degrees have a strong tendency to follow institutional aims (factor 1), while the other groups assess these category very low. Because of the small number of bachelor graduates, these differences are not statistically significant. But in contrast, the analysis has shown significant differences in factor 3 (0.000). Marketing orientation plays a minor role for professors than for the other propositi. The sensitivity for marketing themes seems indirectly proportional to the level of scientific qualification.

Discussion

For the interpretation of the empirical findings the following methodological restrictions has to be considered:

1. The results are in the thematically background of academic continuing education. This section of data is limited to Germany and cannot be transferred to the global context of academic continuing education.
2. There could be a selective influence because of the method online-survey. It may be the case that internet technology savvy people are more capable to answer the questionnaire.
3. Consequently there can be a tendency to extreme values on questionnaires. This seems especially problematic for the comparing of public and private institutions, because the last one has with nine a much smaller sample.

What conclusions can be drawn from the findings? How can the findings be interpreted in the context of higher education development? First, it can be stated that the use of internet technologies in academic continuing education is motivated by a number of strategic objectives. With the online survey three objectives, which focus respectively different contexts, could be identified: the institution (factor 1), the participants and their learning process (factor 2) and the education market (factor 3). The weighting of the objectives is in relation to professional characteristics of the persons involved in programs of academic continuing education. By using statistical methods (e.g. ANOVA) these relations were examined and explained in detail (see above). But what are the possible reasons behind these differences? Subsequently, the findings will be interpreted in the light of current discourses on higher education development.

- It became clear that members of universities of applied sciences put more weight on institutional aims than the other groups (universities, art schools). The reasons for this may be the career path of this group and institutional characteristics of this institution type. Staff turnover is significantly lower at universities of applied sciences than in other academic institutions. In addition, these institutions are smaller than universities and have lower financial resources. Therefore members of universities of applied sciences are forced to cooperate, which in turn leads to a higher degree of social involvement and identification with institutional strategies.
- Members of private institutions have weighted institutional aims more heavily than their colleagues from public institutions. Possible reasons for this are the specifics of private institutions. Due to the lack of public funding, these institutions are more strategic oriented, e. g. the increase of turnover. Since it requires the economic-financial survival of these organizations, strategic objectives are communicated to the single institutional members, and thus have identity-building and action-controlling effects.
- The objectives of using internet technologies also vary according to the type of education program. While people who are involved in study programs pursue

institutional objectives, marketing objectives play an important role for single modules (e. g. webinars) or certificate programs. The differences in factor 1 are hardly surprising, since study programs are subject to many institutional requirements, e.g. for accreditation. In contrast to that, single courses or modules are often booked by participants to solve current problems at work, so these must be very strongly geared to the needs of the market.

- The findings have shown that people with lower academic qualifications (master or bachelor degree) intend much stronger to increase the visibility of education programs by using internet technologies than their colleagues with high qualifications (professors/postdocs). Possible reasons for this might be found in the characteristics of scientific career. Reputation is the currency of scientists [9]. Therefore, the increase of the visibility especially at the beginning of the academic career is essential for young scientists. The findings suggest therefore, that young scientists instrumentalize internet technologies to increase their scientific reputation.

The presented ideas should be considered as suggestions for interpretation. Detailed, scientifically reliable statements concerning the relations between the objectives of using internet technologies in academic continuing education programs and the personal characteristics of involved people cannot be derived from this data base. Therefore, further studies are necessary, for example in the form of qualitative interviews with various stakeholders.

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THE IMPACT OF AN ETHICS OF CARE ON THE IRON TRIANGLE IN ODL

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Abstract

There are claims that distance education and in particular open distance learning (ODL) are unique in providing broadened access to higher education at lower costs without compromising quality. While traditional face-to-face higher education is caught in the fixed vectors of quality, access and cost, the so-called 'iron triangle', distance education and in particular, *online* distance education promises to break the 'iron triangle'.

Much of the current discourse is centred on the notion of access and quality with little contemplation of the inter-dependencies between access, quality and cost in the light of often dismal student retention in distance education contexts. Amid increasing public and regulatory scrutiny, changing funding regimes, and increasingly underprepared student populations *and* faculty, ODL institutions spend more and more resources to improve student retention and success without compromising quality or 'closing' the revolving doors. While ODL's commitment to social justice in providing increased access is laudable, providing such access with little reasonable chance of success may actually constitute justice denied or deferred. Focusing just on justice is potentially insufficient and we should possibly move beyond frameworks of justice to frameworks of justice *and* care. The question arises then: *How scalable and cost-effective is an ethics of justice and care in ODL?*

This exploratory conceptual paper approaches the traditional vectors of access, cost and quality (the iron triangle) from the perspective of an ethics of justice and care. From the context of an ODL institution in a developing world context (the University of South Africa, Unisa), this paper questions the central claim of the iron triangle that high quality teaching and learning can be provided to an increasing number of students without raising the cost of provision or lowering quality. The paper briefly explores criticisms of the iron triangle before problematising its underpinning assumptions from the perspective of an ethics of justice and care.

Introduction

Distance education and especially open distance learning (ODL) institutions are generally synonymous with social justice in that they provide access to students otherwise excluded from access to higher education, or those not able to access residential or face-to-face higher education, for whatever reason. While student attrition and failure is of concern to the wider higher education sector, it is of particular concern in distance and ODL contexts (Gaskell & Mills, 2015; Simpson, 2013; Subotzky & Prinsloo, 2011; Woodley, 2004). In an attempt to improve student attrition and success, ODL institutions increasingly allocate more and more resources to support and care for underprepared students *and* faculty (Prinsloo & Slade, 2014). While ODL's commitment to social justice to provide increased access is laudable, providing that access without those students having a reasonable chance of success may constitute justice denied or deferred (e.g., Botes, 2000; Clement, 1996). Some authors (e.g., Noddings, 1999) claim that focusing just on justice is inadequate and that we should move beyond frameworks of justice – 'care often "picks up" where justice leaves off' (Noddings, 1999, p.12). The question then arises: *How scalable and cost-effective is an ethics of justice and care in ODL?*

This exploratory conceptual paper approaches the traditional vectors of access, cost and quality (the iron triangle, e.g., Daniel, Kanwar and Uvalić-Trumbić (2008, 2010a, 2010b) from the perspective of an ethics of justice and care. There are claims that the iron triangle of access, cost and quality is 'broken' and that distance education and online education can achieve high quality teaching while, at the same time, lower cost and widen participation (Daniel, Kanwar & Uvalić-Trumbić, 2010a, 2010b). There are also others who claim that we need to revisit the foundational assumptions and epistemologies on which the iron triangle is founded (e.g., Hülsmann, 2004; 2014; Kanuka & Brookes, 2010; Power & Gould-Morven, 2011; Lane, 2014) and Power and Guild-Morven (2011) suggest that the iron triangle has become 'dated and fundamentally unworkable, an industrial solution in a post-industrial period' (p.24).

From the context of an ODL institution in a developing world context (the University of South Africa, Unisa), this paper firstly questions the central claim of the iron triangle that high quality teaching and learning can be provided to an increasing number of students *without* raising the cost of provision or lowering the quality. It continues by briefly discussing some of the criticisms of the iron triangle before problematising some of the assumptions underpinning the iron triangle from the perspective of an ethics of justice and care.

Problematising the iron triangle

Some claim that 'equity and excellence are not mutually exclusive' (Whiteford, Shah & Nair, 2013), while others feel that 'distance education can achieve any two of the following: flexible access, quality learning experience and cost-effectiveness – *but not all three at once*' (Kanuka & Brooks, 2010, p.69; emphasis added). Power and Guild-Morven (2011) therefore claim that the concept of the iron triangle is 'dated and fundamentally unworkable, an industrial solution in a post-industrial period' (p.24).

Within the context of the changing funding regimes, increasing student debt and dismal student retention and course rates, a number of questions arise: *How do we balance justice and care in relation to cost, accessibility and quality?* How do we balance education as moral practice (Giroux, 2003) with its implied ethics of care, with an ethics of justice with its dominance of rational rule-based accountability and admission regimes? How do we go beyond justice and consider care as a guiding principle when thinking about student retention and dropout in open distance learning contexts? How do we counter claims that ‘justice untempered with care may actually introduce new inequities as it seeks to renew old ones’ (Noddings, 1999, p.1)?

Reconsidering the iron triangle

The three elements of the iron triangle – access, quality and cost – have for many years been the ‘bugbear of education’ (Daniel et al., 2008, p.6). The three points of the iron triangle are not only linked but also interdependent. The iron triangle has two main characteristics namely ‘it may be distorted in different ways’ with different trade-offs between the vectors. Such trade-offs cannot, however, change the second characteristic; namely that the triangle has ‘a fixed length perimeter’ (Power & Gould-Morven, 2011, p.23). According to Daniel et al. (2008, 2010a, 2010b), traditional higher education provision is unable to increase or widen access without affecting cost and/or quality. These authors claim that distance and online education can break the iron triangle.

It falls outside the scope of this paper to discuss the different adaptations and de/reconstructions of the iron triangle. Suffice to point to three examples of authors who question the suitability of the iron triangle (broken or not) to inform thinking about cost, quality and access in the context of distance education provision in the 21st century. After briefly discussing these three examples, I pose a number of questions from the specific context of ODL in a developing world context.

Lane (2014) petitions for an enrichment of the iron triangle and proposes a combination of the iron triangle with the interaction equivalence theorem (Anderson, 2003). Lane’s proposal however relies on a limited and bounded understanding of student success as being dependent on students’ motivation, preparedness and ‘organisedness.’ Lane (2014) does not provide any rationale for his selection of these specific three variables as basis for the notion of a ‘circle of success.’ Compared to other models explaining student success (see the overview by Prinsloo, 2009) and specifically the socio-critical model for understanding and predicting student retention and success developed by Subotzky and Prinsloo (2011), Lane’s proposal ignores the seminal role of *context* and student success as a complex phenomenon that constitutes a rite of passage consisting of mostly non-linear, multidimensional, interdependent interactions at different phases in the nexus between student, institution and broader societal factors.

Power and Gould-Morven (2011) reject the iron triangle on the basis that the model does not ‘associate vectors with specific stakeholders’ groups, nor does he [Daniel] discuss how the needs of faculty, students, and administrators may differ’ (p.25). In their critique, Power and

Gould-Morven (2011) then propose, with no specific justification, that ‘*students* are naturally (sic) most concerned about *accessibility*...., *faculty* are typically defenders of *quality*, whereas *administrators* are tasked with assuring *system cost-effectiveness*’ (p.25). While it cannot be disputed that the different stakeholders may have different interests with regard to cost, access and quality, I find it indefensible to make these mutually exclusive. For example, while access is important to students, surely the quality of the learning experience and the credibility of the completed qualification are also important? It is crucial to situate the cost of learning not only on the side of the institution but also account for costs to students and take cognisance of the increasing concerns about student debt. Based on their proposal, Power and Gould-Morven (2011) conclude that blended online learning design (BOLD) manages to provide increased access without compromising quality or increasing costs.

Hülsman (2014) suggests that any claim of distance education and elearning as ‘the most cost-efficient form of educational provision is very much based on scale economies’, a notion that he deconstructs and rejects. He criticises the iron triangle’s blurring of ‘average cost per student’ and ‘total cost’ (par.15), the impact of the size, diversity and complexity of the programme qualification mix (PQM) and the additional costs when institutions attempt to address diversity in student profiles through different delivery modes. (For a full discussion see Hülsman, 2004, 2014).

In addition to the above enrichments and criticisms, relationships between the different variables impacting on student success necessitate that we question many of the assumptions underpinning the “brokenness” of the iron triangle. For example, students and the institution are co-responsible for success in a dynamic and often unpredictable environment where student habitus, dispositions and context meets institutional (in)efficiency in a dynamic interplay with factors in the macro personal, socioeconomic and political environments of both the institution and students (Subotzky & Prinsloo, 2011). This raises a number of questions such as: How fixed can the vectors of the iron triangle be in such a dynamic and often unpredictable context? And secondly, should ODL in developing world contexts serve social justice by providing increased access and opportunities to often underprepared students by underprepared faculty, it also implies providing increased support to faculty and students in a commitment to uphold quality standards. What are the cost implications of providing access and care? How scalable are higher levels of care? What are the implications of *not* caring or implementing care that is not scalable at cost?

The notions of “access” or “openness” in ODL imply that, depending on context-specific legislative and regulatory frameworks, many students enrolling in ODL don’t necessarily have access to traditional residential higher education, and secondly, are possibly underprepared (like many faculty) for the challenge of higher education and the unique requirements of studying through distance education. This may result in a cohort of students who have been granted *access* in terms of the social mandate of open education, but who often fail or dropout or require additional generic and personal support and care. The additional support rendered to institutions with the aim of optimising students’ chances of success comes at a cost and is often implemented without consideration of the appropriateness, effectiveness or integration

with other institutional initiatives. As funding increasingly follows performance rather than precedes it, ODL institutions have to reconsider the scope and implications of their openness and the cost and scalability of care, without substantively changing their social mandate of doing so.

An ethics of justice and care in ODL: implications for the iron triangle

An ethics of care and an ethics of justice are often positioned as opposites (Botes, 2000) and the relationship between the two concepts have been described as ‘duet or duel’ (Jorgensen, 2007). Gilligan (1982) contends that while these two concepts are often seen and practiced as oppositional and mutually exclusionary, both care and justice have a place in ethical decision making and that ‘the two aspects are *inextricably linked and in constant interaction*’ (Botes, 2000, p.1073; emphasis added). (Also see Flanagan & Jackson, 1987; Joynt & Gomersall, 2005; Katz, Noddings & Strike, 1999).

Justice versus care

An ethics of justice is based on the decisions of an ‘autonomous, objective and impartial agent’ (Edwards, 1996 in Botes, 2000, p.1072) formulating and applying universal rules and principles to ‘ensure the fair and equitable treatment of all people’ (Botes, 2000, p.1072). An ethics of care, on the other hand, focuses on fulfilling ‘the needs of others and to maintain harmonious relations’ (p.1072).

Criticism against an ethics of justice in the health profession is based on the increasing depersonalization, objectification of individuals and the ‘standardisation of all professional activities as part of a quality-control exercise’ (Botes, 2000, p.1072). The principles and defining characteristics underlying an ethics of justice cannot sufficiently address and accommodate the complexities, intersectionality and multi-dimensional nature of individuals and different relations in different contexts. In a certain sense, ODL as moral practice and public good is already a counter-narrative to the question of desert, which proposes that some students deserve access to higher education, while many prospective students may have to accept that they do not have access. In the context of an industrialised model of ODL and the increasing demand for access to higher education, this raises the question: *how practical and scalable is the notion of care?* How do we scale and implement an ethics of care in distance education institutions with thousands of students, in the context of different, complex combinations of admission requirements, presentations, diverse assessment practices and credentialising? Also, how many opportunities should students be provided to pass a particular module? ODL institutions will often take extra care towards students deemed more at risk and provide them with additional opportunities, while the same scope of care may not be awarded to students who just miss getting a distinction. What are the implications of being selective with regimes of caring? When does our selectiveness in caring actually constitute injustice? Are we still committed to justice without caring?

Care and equity

Noddings (1999) moots the interesting point that ‘when a just decision has been reached, there is still much ethical work to be done’ (p.16). In the context of providing equitable educational opportunities, caring means investigating and providing a range of reasonable alternatives and resources. Noddings (1999) argues that treating everyone alike does not necessarily mean providing everyone with what they want, but rather what they need. An equitable and caring approach means that ‘instead of assuming a false universalism, it recognises deep and perhaps irremovable differences – differences which counsel against sweeping solutions that affect people’s lives directly and preclude their effective use of self-chosen strategies’ (p.19). What are the implications for standardised curricula and assessment strategies? How scalable is the care suggested by Noddings (1999)? How scalable and cost-effective is providing a range of reasonable alternatives and resources?

Care, justice and power

The understanding and practices of caring, justice and fairness are furthermore embedded in historical and present socio, cultural, economic, technological, political, and environmental power relations (Subotzky & Prinsloo, 2011). Legal and policy frameworks have always been informed by religious, cultural, gender and class power relations and used to sanction dominant beliefs and societal power structures (Apple, 2004, 2010; Bernstein, 1996). When our understanding and practices of justice and care are understood in terms of relations of power, it raises questions regarding how our current strategies address student dropout and failure. An ethics of care seems to acknowledge the unequal power relations and commits itself to being transparent regarding its intentions and processes, whilst also considering the often unforeseen implications of an ethics of justice.

Positive rationality versus an extended communicative rationality

The concept of rationality proposes that findings can be justified through argumentation. An ethics of justice is founded on a positivistic or modernistic rationality that, for the sake of objectivity, reduces complexities to formulate universally applicable rules and principles. Opponents to an ethics of justice moot the notion that moral and social phenomena are complex, dynamic and multifaceted, making it almost impossible to predetermine definitions of fairness and justice. A socio-critical understanding of student success or failure illustrates the relational complexity of different interdependent and often mutually constitutive variables, which almost make it impossible to formulate minutely detailed rules, and regulations that encompass every possible combination and scenario. Subotzky and Prinsloo (2011) therefore point to the importance of the relationship between students and the institution and ‘*actionable mutual knowledge*’ (p.183). In the context of widening access, to what extent does our commitment to justice and fairness *exclude* caring from our processes and policies?

Reductionism versus holism

‘The reductionism approach is, in all probability, the Achilles heel of the ethics of justice, as it is not plausible for the sake of objectivity to reduce ethical problems in order to relegate values and emotions’ (Botes, 2000, p.1074). An ethics of care suggests that a phenomenon to be studied in its entirety should also consider the impact and causal power of structures. A case in point is acknowledging the socio-economic legacy systems and how they shaped and still shape students’ preparedness for higher and open distance learning. Institutional admission criteria or criteria informing the scope and practices of educational triage therefore need to take cognisance of the causal historical legacies of social structures (Prinsloo & Slade, 2014). Do our rules and regulations acknowledge the complexity of student (dis)engagement? To what extent and how does widening access impact on our levels of care and our ability to consider individual student context in a holistic manner?

Most literature on the difference and possibly mutually exclusive nature of an ethics of justice and an ethics of care refer to the fact that an ethics of justice is based on the claim that it is possible to formulate guidelines or criteria that are universally valid and applicable *regardless* of context. On the other hand, an ethics of care emphasises the importance of context and that contextual factors may, at times, require non-adherence to guidelines or criteria originating from an ethics of justice. (See Prinsloo & Slade, 2014 for their discussion on the importance of context in an ethics of care).

(In)conclusions

This exploratory conceptual paper engaged with the traditional vectors of access, cost and quality from the perspective of an ethics of justice and care. Claims that distance education and ODL in particular can widen access, without compromising on quality or increasing costs, were critically explored and found more complex than the current rhetoric implies. Providing access to an increasing number of students who need additional support and care, has direct implications on the cost and scalability of care. If justice without care constitutes injustice or justice deferred, we need to (re)consider the cost and scalability of care.

Engaging with the proposed notion of the ‘brokenness’ of the iron triangle (Daniel et al., 2008) through the lens of an ethics of justice and care raises important considerations and contestations. In the context of the historical roots of ODL as serving social justice, we need to question many of our assumptions not only about the linkages and inter-dependencies between cost, quality and access, but also question the purported claims of the ‘brokenness’ of the iron triangle.

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PEDAGOGY AS A *TECHNÉ*: MEANINGFUL ICT INTEGRATION IN FORMAL LEARNING SCENARIOS

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Abstract

This paper presents a framework developed by JP-inspiring knowledge with different stakeholders that aims at the creation, preparation and evaluation of ICT integrative projects in formal learning scenarios. This proposal served as a basis for master training on meaningful pedagogical strategies with ICT, in several countries: Angola, Bolivia, East Timor, El Salvador, Ivory Coast, Jordan, Peru, Portugal, and Puerto Rico. Each of these training projects targeted different stakeholders: elements from Ministries of Education and Technologies, Pedagogic Specialists, Curricula Designers and Teachers. Its general structure was designed inside and outside classrooms, not only with teachers and students, but also with school directors, parents and ICT companies. Here we present the main characteristics of this framework – the ik-Model – and the process through which it is being conceived as a relevant pedagogic transformational element. ICTs are no more conceived and integrated as tools or resources in learning scenarios, but as contexts. This perspective challenges not only the way they may be thought inside those spaces, but also the way people look at their own role in this process. Finally, we discuss how this approach acts towards a reconfiguration of pedagogy as a *Techné* and how this requalifies teachers' momentum within most of the changing processes of actuality.

The origins of ik-Model

The technological modernization of schools has been an up to date issue in politics and academic educational debates. To assume that technology must be present in schools assuring an equality of conditions for learners to learn and learning to happen is an argument commonly used in policies' agenda. Some arguments following this trend focus the growing presence of ICT in most children's everyday life. Given the fact that schools are conceived as natural contexts, those arguments state that they have responsibilities on helping students dealing with challenges ICT pose, both in their present and future lives. Some other arguments are concerned with equal opportunities and school's compromise in what concerns preventing social gaps reproduction. Some academic literature points out not only a gradient perspective of *good / bad* effects, but a non-simple correlation, where context plays a fundamental role (Gigler, 2011, 2004; Willms, 2006; Avgerou, 2001; Walsham, 1993). While studies reflect upon ICTs potential to generate socio-economic and political opportunities for developing countries, reducing the "digital divide" (Cullen et al., 2011; Gigler & Simmons,

2002; Pohjola, 2002; Braga, 1998), some other investigations focus on the gaps ICTs reinforce, reproducing the actual differences (Law, 2009; Wade, 2002; Gumucio, 2001; Castells, 1998; Panos, 1998). In fact, some studies do even mention that ICTs may lead to exclusion of those who don't have access to them and to dominance from the part of those that control them (Karsenti, 2009). Although these perspectives show different approaches to this topic, it seems quite consentaneous that using ICTs with intentionality may lead to better strategic life choices, an increase on literacy levels (*ibid.*) and a reinforcement of real freedoms (Sen, 1999), agency and functioning (Kabeer, 1999). That intentionality has education change at its centre (UNESCO, 2014).

When we generally talk about new technologies integration in the particular context of educational systems, a mixture of enthusiasm about modernization and scepticism about learning possibilities tends to characterize the attitude of many educational agents. Delivering the best technological solutions to schools and classrooms is certainly not the issue to be addressed; conditions for an effective use of technology are needed and that is why methodologies must be challenged. The capacity to take risks usually favours the emergence of new narratives and new patterns of action and thinking. This request makes it crucial to have a basis of conceptualization, implementation and monitoring that considers the different components that such a transformation comprehends. As UNESCO (2013a) reminds us, the educational sector is composed by educational decision makers, administrators, teachers, students and parents, as well as by other concerned parties, that contribute to the accomplishment of educational goals. This picture seems quite sufficient to understand how difficult the attempt to map and link the interests and perspectives of all these stakeholders can be.

It's also mandatory that different sectors engage to better answer the challenges that fast changes on larger systems – including technological environments – are posing to citizens in their different living scenarios. Companies such as the Portuguese JP-inspiring knowledge (JP-ik) succeeded in providing high quality technological devices for education all over the world, but soon the challenge turned into the participation in the great momentum of educational transformation. A *product-perspective* could no longer be maintained and JP-ik became a Service's company, where project-consultancy-in-context and stakeholders training – aiming a meaningful and contextualized technological integration – are seen as crucial pieces along with equipment development, delivery, technical support and maintenance. Therefore, JP-ik Pedagogical Department centres its mission in the development of pedagogic methodologies towards a comprehensive ICT integration, particularly in formal educational systems. Its work is grounded on field studies and it is developed with different intervenient: stakeholders, implementers and beneficiaries. In a project-based approach to a large-scale ICT integration in educational systems, all these elements participate in a collective construction, implicitly switching their roles. We cannot conceive stakeholders as unique decision-makers that identify who the targets will be and which strategies should be implemented. All the interveners are expected to contribute to a global vision and to address some questions to the elements that are playing in the other layers.

In this paper we are presenting a model for ICT integration that JP-ik has developed with educational agents worldwide within this collaborative and multilayer collective approach. This model respects the idea that current ICTs shape multiple contexts in contemporary postmodern societies. Following Lewin's theory of psychological fields (Bronfenbrenner, 1977; Lewin, 1917, 1931, 1935), Bronfenbrenner (1994) presented the ecological environment as a set of structures that now enables us to think about communication technologies as those ecological environments that challenge standards, norms, attitudes and living patterns at all systemic levels. The ik-Model puts signification at the heart of its dynamical structure because it is the expression of the highest contextual engagement.

This framework tries to grasp the web of interests that the question of ICT integration in different fields of activity raises and that some other models also try to address from different perspectives. If we look at the beneficiaries' level of integration, usually teachers are the main figures to be entailed. The *TPACK* Framework, proposed by Koehler and Mishra (2005) systematizes the knowledge domains (and its particular combinations) – Content, Pedagogical and Technological Knowledge – that are fundamental for teachers to successfully integrate new technologies in learning activities. It is centred in the implementation phase of ICT in education and it focus its main users. The capacity to endure in this implementation and improve learning scenarios can also be measured by the *SAMR Model* (Puentedura, 2013).

Some other models refer to a macrosystemic vision, as the *UNESCO ICT Competency Framework for Teachers* that entails different components for a contextualized integration: i) policy level and the capacity of understanding ICT in education; ii) curriculum and assessment; iii) pedagogy; iv) ICT as tools; v) organization and administration and vi) teacher professional learning. This framework enables the stages of planning, survey, analysis, localization and development, where the national strategy or policy is identified, in terms of innovation implementations in schools and teacher's professional development (UNESCO, 2013b). In the same manner, the Intel Education Transformation Model is a comprehensive framework that has the improvement of educational systems as its main goal. It sets student success at the heart of educational transformation and it covers different layers that include leadership and policy, as well as research evaluation, teachers' professional development, curriculum & assessment, information communications technology and sustainable resourcing (Intel Education, 2013).

The proposal made by JP-ik, the ik-Model, does not pretend to be an alternative to the models referred here. In fact, this is a framework created in context, throughout a year, close to different educational players: one ERTE-MoE Coordinator, seven DRE'S-MoE stakeholders, eight municipalities' stakeholders, six school cluster principals, one principal assistant, twenty nine primary teachers, thirty seven parents and seventy six students. After a phase of data collection on representations, attitudes and levels of ICT integration (Paiva et al., 2012; CoSN, 2013), six pedagogical consultants were placed in six schools throughout a school trimester, in different regions of Portugal. The aim of this work was the development of a strategy for ICT meaningful integration with teachers in their own learning scenarios. Each activity was designed in terms of particular criteria and its dynamics and effects were thought within a

community of practices comprised of teachers engaging this “best integrative practices” pilot. For all these teachers, the technological modernization of their classrooms requested innovative pedagogical practices, but only because knowledge was at the centre of this negotiation. All participants of a learning environment were seen as part of the knowledge continuum, where both students and teachers were expected to be “emancipated spectators” – using Rancière’s (2008) concept of spectatorship – , and that meant that students and teachers could not be separated from their capacity of knowing and acting. Therefore, learning was put at the centre of the classroom and meaning at the heart of contextual learning design.

This pilot gave us relevant insights on how digital literacy is affecting the daily routines of teachers, students and families. As a prior gain, it favoured the quality of the exchange between children and technologies’ generative potential, as students finally perceived technologies as a legitimate learning channel, becoming more autonomous, assertive and differentiated on their usages. The strategic axis of the intervention successfully helped to signify school contents within the needs of daily life. It also confronted institutional boundaries for learning, as the data meaningful transfer – amongst students with different ages and between those students and their parents – became stronger.

As technology development wheel spins fast – but sociopolitical opportunities persist – digital divide consecutively emerge. Therefore, an approach that focus the generative capability to learn stands for propulsion towards the new. It may foster the individual capability to spontaneously exert a greater autonomy, critics and engagement connecting different opportunities settings and making them confront their own weaknesses and strengths.

The ik-Model framework

This framework was conceived in order to guide different stages of the technological integration process in formal education and it is differently operationalized in each one of those phases. The ik-Model acts as a reference to i) the design, development and implementation of a project, either at a macro level or considering a specific learning environment; ii) the training – capacity building or even empowerment – of different stakeholders, including elements from the Ministry of Education, Pedagogical Coordinators, Teachers, Parents or Students; and iii) the monitoring and evaluation of the project, revealing its capacity to produce specific gains and enabling to recognize the particular conditions in which they are produced.

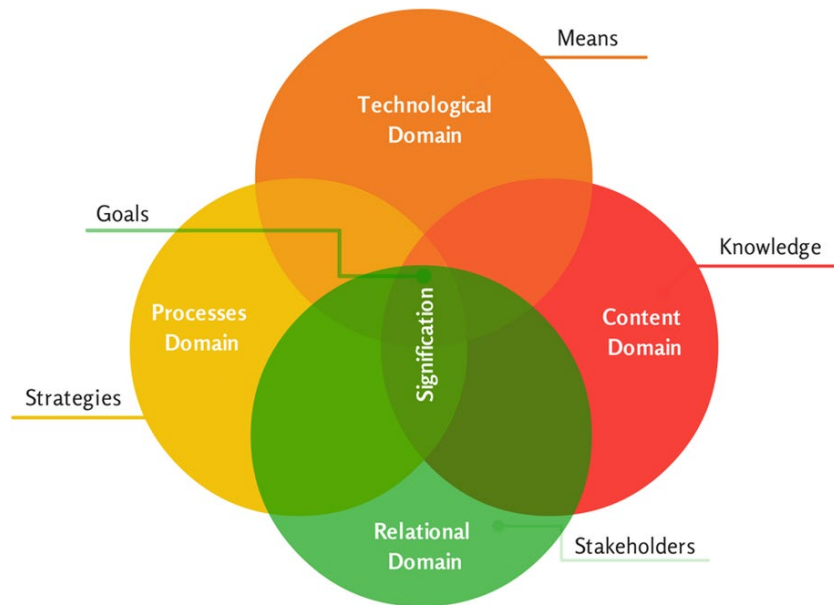


Figure 1. The ik-Model: a framework for ICT meaningful integration in learning scenarios

This proposal considers technological domain as one of five parts when we think on ICT meaningful integration on the different sectors of activity. This **Technological Domain** considers the resources and technological tools that can be used to achieve specific goals and that obviously has to do with media literacy. The capacity to choose the most accurate *medium* to fulfil a specific interest is a challenge to which stakeholders and all the intervenient have to answer in order to accomplish meaning through particular strategies and processes. This immediately shows that each one of these parts are elliptical as they take into account all the others. The **Content Domain** includes the educational challenges that are transformed into learning goals, knowledge and skills that are expected to be addressed in educational formal scenarios. The curricular infusion of larger goals and meaningful information through ICT usage is therefore intentionally considered as the main pedagogical strategy. These domains enable us to select the type of content and resources that accurately fit to those learning aims, always remembering the the ones involved and their real capacities, as well as the perspectives and roles (the implicit or the explicit ones) they assume within the process. The **Relational Domain** considers not only the stakeholders and beneficiaries, but also the larger community in which the project will take place and the way it creates attitudes that can favour or compromise a deep and shared engagement. So this component does not only focus intervenient's explicit interests, but also networks' structure, dynamics and its tacit discourse layer. Through this approach we may understand processes of resistance or commitment from within. In fact, the **Process Domain** crosses all the above mentioned components and it comprises the strategies and the methodologies that are used in order to achieve specific goals, while reinforcing engagement processes. Only the intersection between these components and the extent to which each one is intentionally revised in all the others enables us to create **Signification** as the upmost value of any developmental approach. When signification dynamic is considered we are not acting outside the collective capacity to participate in the

meaning event, neither using a previous heuristic for learning and acting. The expectations can go beyond particular outcomes and communities can connect to other views, other opportunities and other significant elements.

In fact, a chronic mark of western studies has been the externalized interpretation of the others' needs. Not only disadvantage "communities lack access to information and knowledge, but at the same time, policymakers in capital cities lack knowledge about the local and cultural context of the poor and marginalized groups" (Gigler, 2004, p.4). This assumption was confirmed during the qualitative study on the Portuguese Technological Plan impact: some interviews with teachers and elements from educational political sectors show a clear discursive gap between them, which deepens if we go through other community's layers. Here we do not only face the question of how "to give voice" to those people; we deal with a problem of discourse legitimacy. But why do these difficulties persist, if they clearly raise political concerns and if they cause problems at an appropriation level? From a political point of view, as Habermas shows us, these centric models – based on the tolerance and knowledge of the empowered ones – are rather disturbing and they collapse communication and interaction at all layers. Changes conceived within these principles may be of low value or remain a will from a few.

So, when we propose an organic and flexible structure, like the ik-Model, we may address the challenges of different subjective realities and appeal to the explicit and tacit requests of several educational systems. That has happened when we tested this methodology abroad, training elements from the Ministry of Education of different countries, with distinct priorities. For instance, in Bolivia we've worked with a totally cooperative model – the Socio-Communitarian Productive Model – and in Peru differentiation and personalization, aligned with 1:1 ICT integration, where main issues for further educational investments. The same approach was also used to train teachers from Angola, East Timor, El Salvador, Ivory Coast, Jordan, Portugal and Puerto Rico. Each domain was taken into account bearing in mind the main national educational challenges of each country and its different communities; all the strategy was therefore aligned to work on several themes, such as absenteeism and young marginalization, communities' literacy, learning transfer, motivation, performance and behaviour regulation.

Perspectives on learning, pedagogy and *techné*

With the framework presented here, educability is again posed as a potential outcome to all the participant in a learning process. This anthropological perspective comprehends Daignault's idea (2008) that educability has an intimate relationship with *techné*, as will and agency expression towards pedagogical intervention through technological media. So, pedagogy is for teachers the only way through which their own perfectibility can be thought. Within a structural framework that envisions signification as the only understandable product of a collective effort we may also reconsider teachers' social status. The shift that an ecological educational innovation assumes creates the opportunity to reconfigure visions, roles and tasks. Pedagogy becomes teachers' *techné* through which a prospective vision can be driven. It

also gives teachers the confidence to deal with the challenges that a strong and pluri-dynamic technological turn poses to their contexts, in particular to formal learning scenarios. This theoretical and strategic replacement of pedagogy impacts educational systems on deep levels. It allows formal education to deal with the challenges that are posed inside and outside school borders as really their own.

Facing the streaming of technological change and the way it discloses phenomenological intersection with the question of meaning making, it seems that only facing learning to learn as the ethic and unique compromise of educational formal systems some of the main issues of the contemporary big data societies can have a place to be intentionally explored. This way we may understand the problem posed by conceptualizations that threaten the flux of methodological improvement as they are based on problematic assumptions. That is the case of the usually misunderstood concept of “digital native”. In fact, it doesn’t mean that the new generations – that are the formal beneficiaries of educational systems – and the older ones – constituted by educational agents –, dwell within a gap. That space is the one that matters as it gives power to those agents back. When we talk about “digital native” we are not talking about “digital genetics”; in fact we are calling the attention to the acculturation system that raises those natives. If so, we can no more leave to the random living experience the opportunity of confronting with assertive affective-cognitive tools the problems that technologies of mass communication reveal. This enhances the perception of each educational figure towards a new demanding role that, simultaneously, is an empowering one. A framework like the ik-Model enables an all community to conceive and plan on these terms its own educability – that means we can inhabit an idea of perfectibility that extends the educational project to a whole idea of humanity. A vision following this trend favours a mindset change in what concerns technological integration within learning formal spaces. A utilitarian perspective on devices and resources gives place to a new capacity of understanding technological media as active participants of contexts creation. These new ecosystems are profoundly challenged by their own *dis-placement* and to let sense break through them seems to be the main challenge of formal education in the upcoming years.

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E-LEARNING VIA SYNCHRONOUS COMMUNICATION – EXPERIENCES FROM A LEARNING STUDY COURSE IN HIGHER EDUCATION

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Introduction

At the department of Education at Stockholm University we offer a master program in didactic science. The participants are teachers with a teacher degree who would like to develop their work in school. The programme is half time studies and almost all the participants work full time at school. Since the autumn 2013 we offer the master programme as an e-learning programme (Holsapple & Lee-Post, 2006). One reason is to offer teachers to combine education with work and another motive is to attract teachers from other parts of the country or abroad. Introducing distance education means creating major changes in how teaching and other resources are used. It challenges faculty staff to reflect on and improve the course design as well as exploiting digital technology in order to improve the students' learning process. The overall aim of this project is to develop the learning environment within an e-learning course in relation to its content.

Learning Study

Learning study was developed from the ideas about lesson study of Professor Ference Marton, at University of Gothenburg in Sweden, together with colleagues in Hong Kong at the beginning of 2000 (Marton & Tsui, 2004; Kullberg, 2010). A lesson study is a Japanese form of professional development that centres on collaborative study of live classroom lessons. Lesson study is a translation of the Japanese words *jugyou* (instruction, lessons or lesson) and *kenkyuu* (research or study) (Lewis, Perry & Murata, 2006). The term might also be translated as instructional research, lesson research or study of instruction. According to Lewis, Akita and Sato (2010) these alternate translations remind us that the Japanese term *jugyou* does not focus on polishing lessons, which the English language term seems to connote. The term refers to *live* instruction, not to a lesson captured on paper.

Lesson study was, according to Ko Po Yuk (2012), developed by in-service Japanese teachers to foster their pedagogical knowledge and competence through working together in iterative cycles of planning, teaching and assessing research lessons in their classes. After Stigler and Hierbert (1999) attributed the superiority of Japanese students in international test scores to the use of this approach in professional teacher development, lesson study has spread throughout USA and in other places such as Hongkong, Singapore, Sweden and Iran (Yuk,

2012). Peter Dudley (2012) asserts that there is evidence that the use of lesson study can improve teaching, learning and pupil learning outcomes in a range of school contexts. According to Dudley (2012) lesson study “*works successfully in a system that expects teachers and school leaders to improve professional knowledge and practice through systematic use of collaborative, enquiry-based teacher learning approaches such as LS.*” (p.98)

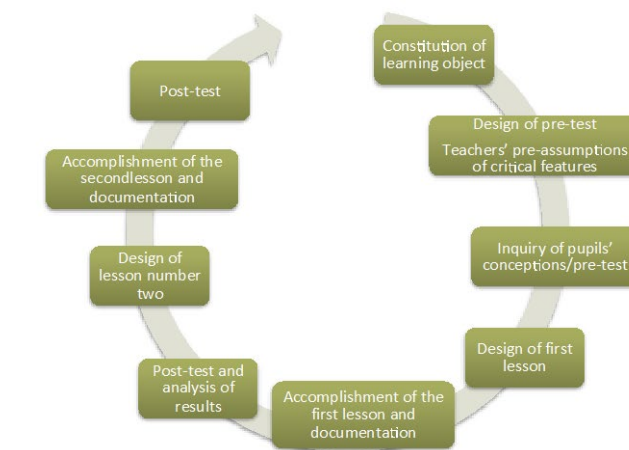
Learning study and lesson study share many common features. Booth studies have a collaborative and iterative process of planning, analysing and revising lessons. They share an aim to improve students and teachers’ learning. They also share a specific learning goal. In a learning study a researcher use to participates in the study. It could also be the case in a lesson study (Kullberg, 2010). In the following we sum up the similarities between lesson study and learning study:

Similarities between learning and lesson study:

- Teachers learn about their pupils’ learning;
- Teachers’ collaborative study of live classroom lessons;
- Aim: to improve teaching and try new ideas;
- The lesson is available for other colleagues;
- A cyclic process: lesson planning, learning observation, analysis, revision of lesson plan.

The cyclic process of planning and evaluating can be described as follow:

The learning study circle



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Figure 1. The cyclic process of planning and evaluating

The most important differences between lesson study and learning study are that in a learning study a learning theory is used (Lo & Marton, 2012; Lo, 2012). In learning study the observation is most often a video recording of the lesson. Specific learning is in the foreground in the learning study. In the learning study pre- and post-tests are used to explore students' learning and what may be critical for student learning. In the following we sum up the differences between lesson study and learning study:

Table 1: Differences between learning and lesson study

Learning study	Lesson study
Competence/learning object	Classroom activities
Teaching research in practice	Development through practice
Collaboration researcher-teachers	Collaboration teachers-teachers
Phenomenography and variation theory	No obvious theory
Since 2000	Since 1920's

The primary focus of the learning study is on an *object of learning*. The teachers and researcher work together. The teachers chose the object of learning. The findings of the learning study are expressions of implications on students' learning can be understood depending on how an object of learning is constituted by a teacher in terms of the intended, enacted and lived objects of learning. A learning study also gives points of departures of how to develop the teachers' competences. (Marton & Booth, 1997; Marton & Tsui, 2004; Marton & Pang, 2006) The constitution of learning objects can be described within the relationship between content of learning, learning outcome and students' knowledge:

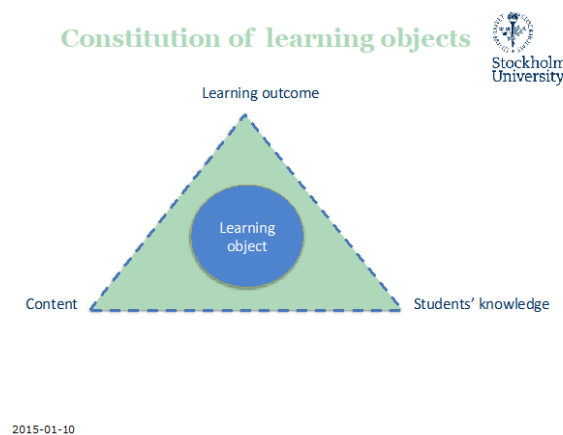


Figure 2.

An aim of the Learning study is to contribute to knowledge about relationships between teaching and learning in school. The framework used in learning study, variation theory, states that, to improve student learning, attention must be paid to what is being learned, the capability that is to be improved and the features (critical features) that it is necessary for the learner to discern.

Variation theory

Variation theory has its roots in the phenomenographic approach (rooted in phenomenology, Husserl, 1995). The Theory also shares assumptions with the socialcultural perspective of learning (cf. Chaiklin & Lave, 1993; Lave & Wenger, 1991; Rogoff, 1990; Vygotsky, 1978). Phenomenography was developed at the Department of Education at the University of Gothenburg in the early 1970's (Marton, 1981; Dahlgren, 1975; Säljö, 1982; Marton et al., 1999). The phenomenographic study explores students' learning and their ways of experiencing a specific phenomenon in the world. Usually in interviews qualitatively different ways of experiencing the phenomenon are categorized. The categories of description describe the variation in the ways of experiencing the phenomenon investigated. Phenomenography and variation theory share a non-dualistic ontological position. Angelika Kullberg (2010) writes:

Although there is an existing world independent of the human mind, the world as we see it prevails only through our experience of it. Since people experience things in different ways, the experienced world varies between people. (p.39)

From the perspective of variation theory there is no difference between the experience and the content experienced. The subject and the object are inseparable and are reciprocally coherent. There is an existing world but it is constituted of the viewer's experiences of the world.

Ference Marton and Mun Ling Lo (2012) emphasises the contribution of variation theory to learning study. Variation theory provides a theoretical grounding to understand some necessary conditions of learning. According to Ference Marton & Shirley Booth (1997) learning is always directed at something – a phenomenon or an object. That leaning always results in a *qualitative change* in the way of experience the phenomenon or the *object of learning*. The learner experiences or understands the object in a different and hopefully a more qualified way. According to Marton and Lo (2012) to see an object of learning in a certain way the learner has to be aware of its certain aspects and to be able to discern these aspects at the same time. Marton and Lo (2012) explain:

Because such aspects are critical to the intended way of seeing the object, we call these critical aspects. Seen from this light, we believe that when students do not learn, it may not be due to a lack of ability. An object has many aspects, and not all aspects are critical; thus students who fail to learn may be focusing on aspects other than the critical aspects. Alternatively, they may not be focusing simultaneously on all critical aspects and their interrelationships, which are required to acquire the way of seeing the object intended by the teacher. (p.9)

Kullberg (2010) emphasises that what is critical to the learners is not the same as their difficulties with the content taught. “Instead it is what they must be able to discern to experience the object of learning in a certain way.” (p.34)

The object of learning has a dynamic characteristic. The intended object of learning planned by the teacher may not be the same as the enacted object of learning teachers try to implement in the class. The lived object of learning – what students actually experience – is not always the same as the enacted object of learning. Marton and Lo (2012) assert this a main reason why in every lesson there are students that learn well and student that learn what the teachers intended.

As Marton and Booth (1997) argue learning is a *function of discernment*, which presupposes an experienced *variation*. If we cannot discern object from its context the learning of an object is not possible. We have to experience variation of the object to discern the object from the context and distinguish it from other objects. (Lo, 2012) Further according to Ference Marton and Ming Fai Pang (2006) to giving attention to a feature of a situation amounts to the discernment of that feature, and the discernment of a feature amounts to experiencing a difference between two things or between two parts of the same thing. As Marton and Lo (2012) argue “Awareness of a single feature cannot exist without the awareness of differences (variation) between features.” (p.10) Marton and Pang (2006) give an example. A shortsighted child cannot separate the shortsightedness from the world that they see. It is inseparable until she or he receives the first pair of glasses. When using the glasses the child separates sight and the world because one of the two, the world, remains *invariant* “whereas the other (sight) changes from “sight without glasses” to “sight with glasses” (p.199). As Marton and Pang (2006) argue the child moreover has the potentiality to discern sight as a dimension of variation within which two different values have been discerned. By wearing glasses in different situations and different times the child can conclude that glasses give a general improvement in sight in different conditions. “When the child occasionally take the glasses off, they experience the *simultaneity in variation* (our italics) between wearing glasses on one hand and being able to see well or not being able to see well on the other” (p.199). To summarize: as Marton and Pang (2006) argue to learn something the learner has to discern the object of learning. Discerning the object of learning amounts to discerning its critical aspects. Discerning the aspect, the learner has to experience variation in a dimension corresponding to the critical aspect against the background of invariance in other aspects of the same object of learning.

Synchronous online discussion

In the late 1990s environments for synchronous online discussions developed. Though most of them have been text-based media. Today more refined technology are offered with audio and web-cam conferencing and shared online whiteboards which bring the online experience closer to a face-to face meeting. There is so far quite little empirical research about how to support discussion in these kinds of media. However we know that the synchronous mode

offers greater spontaneity and more social interactions but is more likely to suffer from technology collapses and networking problems (Rudestam & Schoenholtz-Read, 2010). Students like this mode of learning as long as technical problems are minimal. Comparing different media resources, e.g. students' interaction with the world via Internet or communication with peers via web-based platforms, none covers the full iteration between reflective and interactive discussion with a teacher as in a practical face-to face seminar (Laurillard, 2012; de Freitas & Neumann, 2009).

Though peer discussions are valuable for learning, the teacher plays the most important role in order to scaffold the learning process by structuring the discussion according to a socio-cultural approach. As we investigate how digital environments can support interactive discussion on line there are few studies to draw on regarding face-to face class discussion, though all of them emphasise the importance of the teachers' impact. Text-based chats environments and instant messaging has been successful social media, but in educational settings teachers have to set rules for this meetings beyond the classroom. One reason is that the requirement for quick typing and reactions counteract reflection, which often is one of the course objectives in higher education (Ingram, Hathhorn & Evans, 2000).

Course design and methodology

Learning/Lesson study is a 15 ECTs credit course within the master programme in didactic science. It is half time study and the participants consist of teachers from all school-levels. The number of participants was about 40 in the spring 2013. The course is the third course in the programme. It is optional and it is chosen by 2/3 of the programme students. Two university teachers shared the teaching. The participants were divided into eight peer-groups. The groups were divided on the basis of their school-level and their teaching subjects.

The teachings materials were distributed via an open source LMS. No single technology is optimal for delivery of every kind of message (Moore & Kearslye, 2011) and e-learners need to communicate with teachers and peer students. Therefore Adobe Connect was used for synchronous audio- visible communication between participants, peer-groups as well as university teachers – participants.

Via the course design we tried to offer as many modes of communication as possible. Asynchronous and synchronous written communication was afforded in the LMS. Video lectures, different presentations, external links were also offered in the LMS as learning-recourses. A critical and important mode of communication was the university teachers-participants' mode. In order to avoid solely asynchronous written feedback from university teachers to participants we organised seven web-based audio-visible seminars, which included all the participants led and structured by the university teachers. Every peer-group was represented in the web-seminar by a spokesperson – a different one at every seminar. Between the seminars managed by the university teachers, the peer-groups met in Adobe Connect, in their own "rooms" preparing the tasks for the web-based teacher-seminar. The tasks consisted of written protocols of the different proceedings and understandings of a learning study. The

protocols were written by the participants together in the peer-groups and revised after reading three other peer-groups protocols. Another task in the middle of the course was to perform of a learning/lesson study together with several analyses. To make the performance and analysis possible for the peer-group, as they were physically spread geographically, the participants video-recorded the lessons and showed the film in Adobe Connect for those participants that could not attend physically during the lessons.

Results of the empirical study

The result of the empirical study constitutes of three categories of description. In each category we present a critical feature expressed in our data related to the e-learning environment. The critical feature expresses what is crucial in the participants' experience of the learning study and how and where it appears in the learning environment.

The first critical feature identified in our data is for the participants to make difference between the theoretical concepts of learning object and what is critical or what is the crucial ability. From the participants' point of view we discovered over and over again that the learning object is similar to the critical feature. It implies what is important to the experience of the crucial ability; neither identifies nor separates from the learning object. This was partly discovered in the written protocols and was able to be processed in the synchronous audio-visible web-seminars with the teachers. Compared to a Campus-seminar the digital synchronous discussions offered a focus on each group's particular critical feature without distractions from other students, although the other students listened to the teacher-conversations with all the other groups.

A second critical feature formulated is the participants' opportunity to draw attention to the implications of their own subject knowledge. When the participants pay attention to expected critical features different and undefined understandings of the learning object appear. What they experience in terms of misunderstandings among their students and what they expected the students to experience indicates the teachers' experiences of the learning object supposed to be unclear or unpronounced as in our first critical feature. During the synchronous web-seminars when we tried to scaffold the participants by examples in order to understand the concept of learning objects, we discovered that in some cases the participants' subject knowledge was too shallow in order to discuss and understand the concept of learning object.

The third and most important critical feature is "to make difference between locating the issue to the educational activity or to the individual student". This conception appears in the participants' constitution of the learning object. Here the participants' students are expected to claim familiarity with different issues. They are expected to find information, to bring different information together and to interpret the information they get. When the participants located the issue to the individual student, their students' knowledge was expected to be revised. If the issue instead will be located to the educational practice there are questions about teachers' experiences of the learning object, what the participants' experiences implies to their ways of constitute the learning object and what will be possible to identify as a

critical feature. It implies what is important to the experience of the crucial ability neither identifies nor separates from the learning object. This critical feature appeared early in the course, during the synchronous web-seminars, when the participants were supposed to identify what is critical or what is the crucial ability they must offer their students to learn. In some cases this critical features disappeared when they analysed their lessons, but in too many cases it remained.

The three categories of description reflect how the participants experience learning in the learning study circle. In order for the intentioned learning to take place the challenge designing the next course will be to make possible for the students to discern the critical features.

Conclusions

Our experiences from the first e-format learning study course are more positive than we expected. The synchronous audio-visible discussions increased the focus of the content compared to our experiences from Campus-seminars. The e-learning format created possibilities for enhanced learning, however it required a strong engagement from the participants in the interaction with other peers and the course content. Regarding our first critical feature: to make difference between the theoretical concepts of learning object and what is critical or what is the crucial ability, we redesigned the synchronous audio-visible discussions into smaller groups. In this way each participant get larger possibilities to interact with the university teachers. Regarding, what we consider, our most important critical feature to make difference between locating the issue to the educational activity instead of to the individual student, is still a challenge to overcome through future development regarding digital course design.

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COHERENCE OF ACCELERATED TRANSFORMATIONS AND EXPANDED LEARNING SCENARIOS

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Abstract

Based on a holistic approach an attempt is made to understand the complex relationships with its many related objects. The interaction of theses and antitheses leads to the synthesis and thus to new developments, among other things in education. The processes in all spheres of life of the society, particularly in innovation, knowledge transfer and the related teaching are dominated by permanent transformations. The organizations respond with new enhanced learning scenarios in order to control the acceleration of the transformations from the point of view of content, communication, and cooperation. The increasing knowledge of the management of transformation processes, however, leads to the situation that knowledge, including the appropriate educational systems and processes, can be converted and transferred even more quickly and efficiently. Recently, this period of accelerated development is passing through in all areas of society globally. It is investigated the question which kinds of opportunities exist to control the acceleration by using appropriate methods and designing essential parts of the necessary educational systems.

Introduction

The dynamics of the development of science and technology is constantly increasing. On the one hand, the reason is that the satisfaction of the needs of different target groups leads to an increased motivation to redesign different processes in society, gaining momentum of development. On the other hand, the framework conditions, especially in the field of organization development, international division of labour, new information and communication technologies and new media, etc. are continuously improved and take effect as catalysts for the efficient interaction of resources in accelerating the developmental processes, too.

Information and knowledge management, sharing, and distribution are inextricably linked with this trend. They are essential components of the dynamic global development both in work processes and especially in the education systems. Innovations are not incidentally but very systematically done so that obsolete versions can be continuously replaced by something new and better. Professional management methods are increasingly being taught and

implemented in order to cope with the associated increase in the complexity and intricacy of tasks more efficiently. They provide the very efficient use of available resources for further refinement of different application systems, and thus they contribute to accelerate the further development (Figure 1)

Thus, the current situation is characterized by continuous innovation and resulting transformations leading in shorter time intervals to significant changes, i.e. leading to an acceleration of the processes of change. It is essential to react to the growing flood of requests with noticeable changes in the learning scenarios and the diversification of educational offers to meet the complex challenges adequately. Educational institutions have responded in the regional, national and global context by developing not only new kinds and methods of learning and teaching in special networks and alliances but also by focusing their activities increasingly on the user requirements based on new forms of collaborations

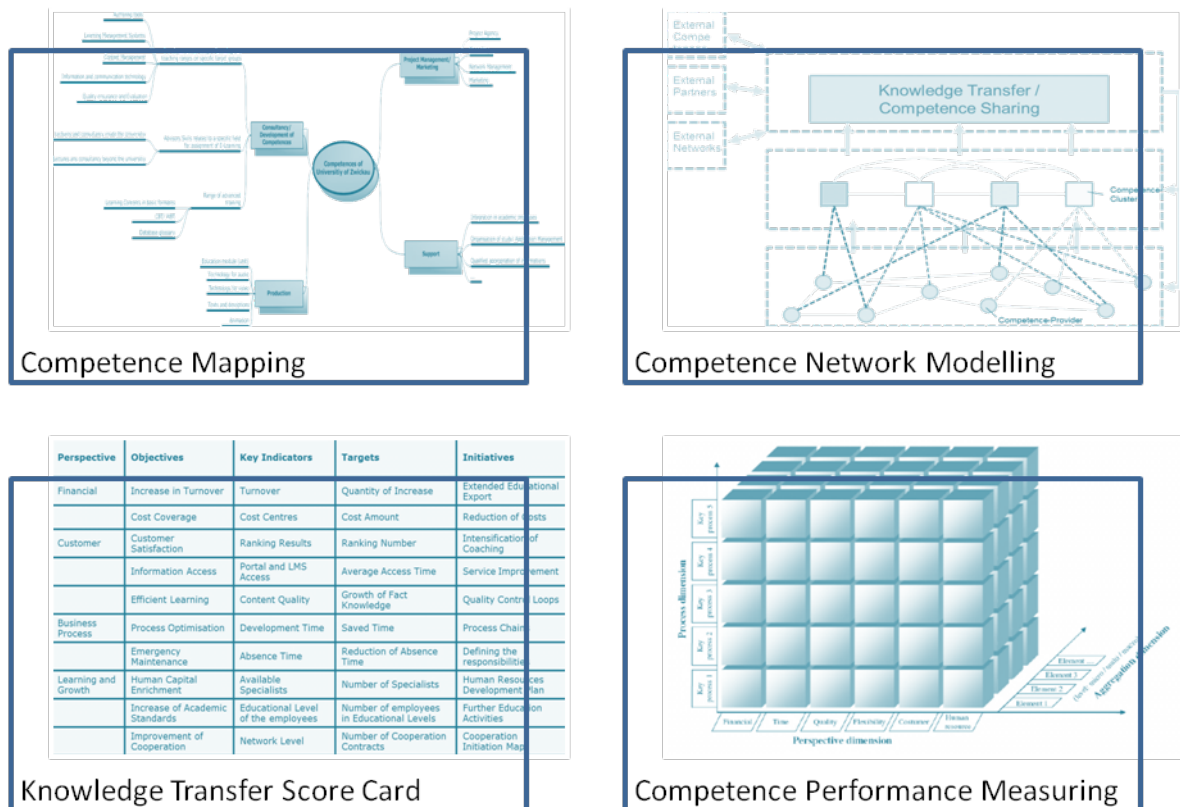


Figure 1. Adapted general methods as particular methods for educational system management (Schumann et al, 2014)

Dynamic of global innovation and information

Innovations are renewals or further developments that make a difference in comparison to an existing state of the art. In general, this means that an improved product or an improved process or an improved system will be achieved. The growing resources in the area of knowledge generation and their increasingly better interconnection especially in a global context effect simplification of the access to information and knowledge and thus better framework conditions for innovation, the acceleration of the processes of change, and an increasing pressure to innovate in the organizations and for their human potentials associated

with an intensification of the innovation competition. Nowadays, companies improve their innovation ability through optimization of organizational structure, business processes and functions. The foci are mainly:

1. Harmonization of the innovation portfolio with the customer need.
2. Development and retention of specialists, experts and professionals.
3. Consistency of innovation and management processes.
4. Use of new product- and service-oriented technologies and perspectives.
5. Slimming down of the organization in particular the processes in the product and service development.

Usually, organizations will try to define their innovation strategy and communicate, to list factors of their innovative abilities, to combine innovation and business strategies closely, to match the culture and the strategy of innovation, to identify customer needs, to integrate expertise in all development processes, to promote research and development, and to manage risks in a professional way (Januzelski, Staack & Goehle, 2014).

Innovations always presuppose the existence of information and knowledge which in turn can be generated only about the available human capital (Cornell University, INSEAD and WIPO, 2014). “Incidentally” resulting innovations are by far and away no longer sufficient in the context of the recent prevailing innovation contest, so that information management is particularly relevant in this regard. Due to the fact that every innovation process begins as an intangible process of collecting, processing and agglomeration of information, it could be – related to innovation projects – that a lack of information procurement induces inefficiency and failure operating on the market. The necessary strategic direction of innovation projects requires the existence of a corporate strategy whose formulation is also linked to the availability of the necessary information, derived from the company itself (identifying strengths and weaknesses) and from the environment of the company (identification of opportunities and risks). Information for innovation planning concern among others the areas of technical, economic, social and political development, competition, regulation, ecology, management technologies etc. (Springer Gabler Verlag, 2014a).

Innovation means in effect to develop something new and creates a difference to the well-established. Open innovation is a new trend. It refers not only to the business sector, but to all social processes in society. Innovation and creativity are set primarily in relation to knowledge or to the possibility of being able to freely access to information products that represent knowledge. The specific nature of knowledge and information is that it is good, which is difficult to control and striving for open use. Up to date, the politics and the big business were mainly able to react by artificial shortage of information and knowledge. Such avoidance strategies have contra-productive effects for innovation. On the contrary, open innovation is understood as an adaptation of the approach developed in the fields of open / free software and open access principles of the free use of knowledge products (Kuhlen, 2014).

Thus, innovations drive developments in all areas of society and initiate over again transformations. The more innovations are systematically forced, the more accelerated transformations are generated. The dynamics of knowledge creation and distribution is very closely related.

Acceleration of transformations and design of teaching and learning

Transformations include the active, systematic modification of systems and the adaptation to new and changing conditions (BusinessDictionary.com, 2014). They are the transition to a qualitatively new specific otherness, which may differ on scope, direction, inner regularity, duration and speed (Heine, 2007).

Transformation management is the targeted analysis, planning, implementation and ongoing development of holistic change actions with the aim to build up more flexibility and reaction potential and to implement a holistic change in the dimensions of strategy, culture and organization (Meyer, 2007).

Transformations induced by two main factors: internal adaptability and external strain to change. By extending the innovation dynamics, the external compulsion to change automatically increases and forces the acceleration of the transformations. The internal transformation ability must be permanently improved, so that the organization can adequately respond to inevitable changes. (Figure 2)

Transformation launches have to be courageous and rapid to succeed. Obstacles for transformations are for example cautious management culture, business-as-usual process, initiative gridlock, recalcitrant executives, disengaged employees, loss of focus during execution. All supporting and hindering factors are directly related to human resources (Miles, 2010). If it is possible, therefore, to improve knowledge and motivation through knowledge transfer and absorption, accelerated transformations can be better controlled. Dynamic transformations in all areas of society initiated by innovations must be accompanied and compensated by accelerated changes in teaching and learning. The transformations in education itself are accelerated because they are part of the overall social development.

Methods for accelerated transformations in the transition to service-oriented architectures describe a systematic approach for the design of optimized processes, functions and modules (SAP, 2012).

If this concept is applied to the field of education, major changes from the development of learning scenarios in unity of vision, business processes, information systems, technology, solutions, migrations and implementations through to change and requirement management and associated transformations will occur. This requires the enlargement of the learning scenarios in any case, too.

External Strain to Change	High	Externally induced Turbulence	Radical Change
	Low	Incremental Transformation	Internally induced Turbulence
		Low	High
		Internal Ability to Change	

Figure 2. Portfolio for transformations determined internally and externally (Heine, 2007)

Expanded learning scenarios

Constructivism, instructional approach, behaviourism and cognitivism are major learning theories characterizing the development of knowledge transfer sustainable. In particular, the constructivism as a philosophical doctrine and in education as a learning theory is combined with the modern scenarios technique in order to realize the knowledge transfer for complex and heterogeneous target groups efficiently. Both the constructivism and the scenario technique have its roots in the system and model theory.

In particular, the decomposition of complex tasks, processes, and functions are the subject of the methodology to develop the holistic understanding of the system by action concepts and method mixes based on an event-based sequence. (Figure 3)

Relationship analysis	Options of design	
	Explorative	Anticipative
Descriptive	Starting from the causes to explore the effects	Analyzing the effects to reveal the causes of changes
Normative	Starting from the existing means to describe achievable objectives	Beginning with the objectives to define the required means

Figure 3. Basic types of scenario planning (Springer Gabler Verlag, 2014b)

The basic idea of constructivist learning theory is that new knowledge can be constructed by using existing knowledge which was generated by actions and distributed by kinds of communicative exchange of information (Nonaka & Takeuchi, 1995).

If the dynamics of innovation and transformation always requires a higher level of knowledge transfer in a lifelong process for an ever-increasing amount of learners, the resources have to be used very efficiently for a growing number of different target groups. But in order to make education more available and affordable, heterogeneities can be compensated through

learning scenarios. Learning scenarios allow to address and to avoid mental underload or overload (Hölscher, 2005).

The often announced target-oriented and at the same time required individualized education is facilitated without binding exponentially increasing teaching resources. The developments in education show that all available options are used and combined to meet the immense challenges of knowledge exchange as prerequisites and part of social transformations. The scenarios technique is constantly being expanded and leads to expanded learning scenarios. (Figure 4)

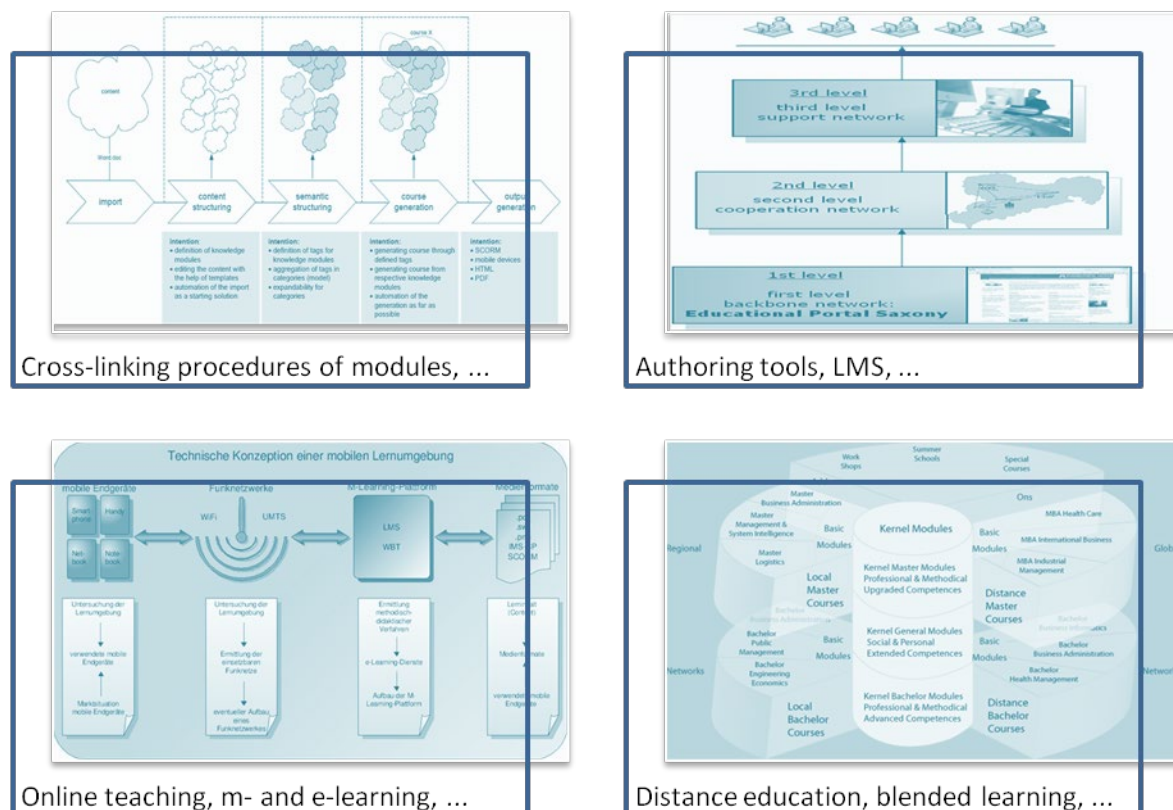


Figure 4. Framework for expanding of learning scenarios

The expanded learning scenarios are generated by combining a variety of manifestations in dimension such as leaning forms (Blended Learning, etc.), learning support (Semantic Knowledge Base, etc.), learning technology (m-Learning, etc.), learning system (Learning Management System, etc.), learning space (Augmented Learning Space, etc.) learning communication (Chat, etc.), learning process (Individual Learning Path, etc.).

Diversification of educational offers in practice

Educational institutions have to operate with limited resources in globalized education markets and to manage more and more complex educational tasks for very different target groups of learners. They respond to the challenges with a diversification of educational offers approving the inconsistency with the limited resources and the associated risk of overextension. In general, strategies of unification and modularization are used, to escape the

dilemma, but it may jeopardize the quality of individualized education. Currently, mainstreams have been identified assisting in solving the complex problem. These include:

- Increasing cooperation and the creation of networks of educational providers
- Extensive use of new learning technologies and media resources
- Growing influence of methodology and didactics in all areas of learning
- Raising interdisciplinarity and transdisciplinarity in research and application
- Professional development of the management and the business processes.

Typical examples of the diversification of educational opportunities in practice involve:

- Online study programs offered by groups of educational organizations.
- Multi and double degree programs offered by international educational networks.
- MOOCs in combination with existing distance education opportunities offered by educational providers.
- Integrated study programs including diversified professional profiles offered by interdisciplinary working groups.
- VR and AR applications as well as m-learning for practical-oriented training offered by enterprises and educational suppliers etc.

There are extensive theoretical elaborations, educational approaches and models, and practical experience to the above mentioned examples. They are based on advanced learning scenarios in order to be able to efficiently control the acceleration of the transformations in education in particular and in society in general in regional, national and international manner.

Conclusions

The coherence of accelerated transformations and expended learning scenarios opens up new opportunities to meet the exponentially growing demands on educational institutions as result of the globalization, digitization, the dynamics of science and technology, the knowledge explosion resulting in an extreme acceleration of transformations. Learning scenarios provide new educational paths, methods as well as didactics and thus the mastery of knowledge transformations in different contexts. The approach was and will be applied successfully in several bilateral and multilateral research projects in different countries as well as in the study offer and program development in special business and cooperation models in regional, national, and international educational networks, associations, and divisions in the form of public and / or non-profit projects or public-private-partnership or private services in training and education, respectively.

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DIGITAL, MATERIAL AND NETWORKED: SOME EMERGING THEMES FOR SET EDUCATION

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Abstract

Boundaries between the digital and material worlds are becoming blurred as the internet increasingly connects us to things as well as people and information. This is increasingly relevant to education as initiatives which significantly combine digital and material elements in networks are becoming a reality for Science, Engineering and Technology (SET) learning. Our paper reports on the initial findings of a project to carry out a 'state of the art' review of literature to establish the key themes, opportunities and obstacles that are emerging from the development and use of these 'hybrid' systems in learning. We wanted to explore the extent to which this new domain of study is being reported in the literature and to identify work representative of this area. Our aim was to investigate the depth of research in this area by going beyond the technologically descriptive to focus on pedagogical and organisational issues raised in the literature.

To identify the state of current research in the area we carried out a systematic search of databases of Science, Engineering and Technology education literature. We found 808 papers relating to the hybrid learning initiatives we are interested in, of which the majority, 81%, involved the Engineering and Technology disciplines while 6.8% related to Science. The vast majority of papers referred to remote laboratories and most of these were concerned with describing the technologies involved. In order to explore issues emerging from the research, we carried out an in-depth text review of a particular subset of the papers found that focussed on pedagogical issues. The three main themes that emerged were: the importance of real data and authenticity in learning; the importance of a sense of presence (e.g. telepresence, social presence and/or immersion) and the locus of control in, and responsiveness of, a hybrid system. We conclude that these new digital 'hybrid' pedagogies offer a lens with which to view both the more traditional material pedagogies, e.g. laboratory-based learning, and purely digital pedagogies, e.g. virtual labs. Finally, issues of authenticity, presence and control/responsiveness will be of increasing pedagogical importance to other 'hybrid' systems, such as those involving ubiquitous computing.

Introduction

In addition to connecting us to people and information, the internet also connects us to material objects, such as processors, sensors and RFID tags (as in ubiquitous computing). Initiatives which combine digital and material elements in networks are becoming increasingly relevant to education and are already a reality for Science, Engineering and Technology (SET) learning in, for example, remote laboratories. We have used the word ‘hybrid’ to refer to networked artefacts which significantly combine digital and material elements (Knutsen et al., 2011). By significant, we mean materiality which goes beyond providing different types of window on to the digital world, important though these differences may be. The project aims to carry out a ‘state of the art’ review to establish the key themes, opportunities and obstacles that are emerging from these ‘hybrid’ initiatives. This paper explains the context of the project in exploring the use of such technologies in distance learning. We briefly describe the systematic method we used to carry out the review of the literature and report some of the findings from the database searches. Finally, we discuss some of the themes we identified from the literature before presenting our initial conclusions.

Context

Accounts of learning technologies to support distance learning typically describe technologies that support discursive learning either through written text or, increasingly video and audio. Learning technologies are often seen as analogues of, for example, seminars, lectures or conferences. However, the boundaries between the digital and material worlds are becoming increasingly blurred as the internet increasingly connects us to things as well as other people. This may hold the potential to include mediated interaction with the material world in distance learning. We are particularly concerned with the opportunities this affords in science, technology and engineering¹ (SET) education, though of course there may be other opportunities in other disciplines. Broadly, SET subjects are primarily concerned either with understanding the material world (science) or with intervening in it to support human activity (engineering and technology), typically through experiments, observations, (physical) models and/or prototypes.

We are particularly concerned with the networked material and digital properties which distinguish hybrids from entirely digital artefacts such as online teaching texts, videos, wikis, blogs and so on. This use of the term ‘hybrid’ to describe the field is intentionally broad and in educational settings might include remote student access to specialised equipment or the students networking sensors local to them to share data as part of a collaborative project. An example of the kind of initiative that is beginning to emerge is The Open University Physics Department’s Pirate remote access astronomical telescope (Kolb et al., 2010). Astronomy undergraduates, predominantly based in the UK, work in small groups to control the telescope (in Mallorca, Spain) remotely across the internet to conduct observations as part of

¹ We have used the term SET, rather than the more widely used STEM (science, technology, engineering and mathematics). While mathematics is an important component of SET disciplines, mathematics itself is perhaps the least material of all disciplines in its concern with entirely abstract concepts.

their assessed coursework. While the history of remotely controlled laboratory equipment might be traced back to the Argonne National Laboratory in 1954 (Ashby, 2008), contemporary computing and networking technologies may be making this a viable mass approach in distributed and mass SET education. Our results below suggest that the most developed aspect of ubiquitous computing today, though, is in the development of remote access to laboratories, primarily in engineering (though this may also be a result of the greater standardisation of vocabulary among engineers, and a consequent over-representation in our search results).

Educationally, the availability of such hybrid learning resources may present important opportunities. Well known theories such as Kolb's Learning Cycle (1984) are founded on the idea that a 'concrete experience' is important for learning followed by 'reflective observation' which enables the student to form an 'abstract conceptualisation' of the experience which then forms the basis for 'active experimentation'. The term 'authentic learning' is widely used to refer to educational practices that connect what students learn in an educational setting with the kind of issues and problems encountered in professional or other practice. This involves developing critical thinking, formal observation techniques appropriate to the discipline and problem-solving skills; all of which engineers and scientists require in their professional lives (Lombardi, 2007). Outside educational settings, people learn from their mistakes and from having to solve problems, for example where equipment doesn't work or unexpected results are generated or results are obscured by 'noise' and confounding factors. Experiment work often entails dealing with such complexity and uncertainty.

Methods

We carried out a review to establish the state of current research in digital material networked learning and to report on themes emerging from the literature. As this domain of study ranges across many disciplines, to locate the existing literature we chose the following databases on the basis of their coverage of science, engineering and technology (SET) education: Academic Search Complete, Article First, Educational Research Abstracts, ERIC, IngentaConnect, Inspec, Library, Information Science and Technology Abstracts, Web of Knowledge, EI Compendex and Education Research Complete.

We used a list of search terms (for example, remote laboratories, internet and education) which were selected specifically to cover the three key aspects of the field, namely: digital/materiality, networks and learning. Overall, we found 2,065 papers. Eliminating papers that were out of scope (i.e. not related to digital material networked learning) and those without abstracts produced a field of 808 papers. By reviewing titles, abstracts and metadata, we then categorised papers by subject area, primary focus of the research study and type of research study. The results (see Table 1) show that the majority of studies reported are in engineering and technology subjects (81.1%). The fact that studies are primarily technology (56.2%) or organisation focussed (23.9%) and descriptive in nature (87.4%) indicates that current research is focussed on pragmatic issues and the field is still developing.

Many relevant papers may not have been picked up by this review process and therefore the papers found should be seen as representative of this research area, but not as definitive. Search terms involving ‘remote laboratories’ yielded a high number of results, whereas other technologies that did appear in the results, such as RFID and Internet of things were found much less frequently. It is not as yet clear whether the focus on remote labs is a result of the methodology used or whether it is a true reflection of their prevalence in the field.

Table 1: Papers categorised by subject area, focus, study type and educational level

Category	Percentage of ‘in scope’ papers (n=808)				
Subject area	Science		Engineering and Technology		Unspecified
	6.8		81.1		12.6
Primary focus of research study	Pedagogy	Technology		Organisation	Other
	14.8	56.2		23.9	5.1
Type of research study	Descriptive	Conceptual	Evaluative	Review	Other
	87.4	2.1	9.3	1.0	0.2

As our interests are in pedagogical and organisational aspects of SET learning and in conceptual, evaluative and review-based studies, rather than those that are merely descriptive, we selected 34 articles for a full-text review from these categories (see Table 2).

Table 2: Science, Engineering and Technology papers selected for in-depth review

Primary focus of research study	Type of study		
	Conceptual	Evaluative	Review
Organisation	2	5	
Pedagogy	2	16	4
Other			5

Because the exploratory nature of the project and the heterogeneity of the papers, a qualitative approach involving thematic analysis and synthesis (Thomas & Harden, 2008) was adapted for the second phase of the systematic review. Prompts used to guide the review included the reasons for setting up digital/material/networked learning, the specifics of the learning example, pedagogical aspects and theoretical perspectives. From the answers to these prompts, important and recurring themes were identified.

Discussion of themes

A number of important themes emerged from the in-depth analysis of the selected papers. The three major themes which we will highlight in this paper concern remote laboratories and include:

- the importance of real data and authenticity in learning;
- the importance of a sense of presence, e.g. telepresence, social presence and/or immersion;
- the locus of control in, and responsiveness of, the hybrid system.

The importance of real data and authenticity in learning

The papers highlighted a number of issues in relation to the importance of the ‘real’ world in laboratory work. The objectives of laboratory work in SET disciplines were clarified only relatively recently by the US engineering body ABET (For further information see Feisal & Peterson; 2002; Feisal & Rosa 2005 cited in Ma & Nickerson, 2006; Lindsey & Wankat, 2012; Stefanovic, 2013 amongst others) Physical experiments are of particular value in that students learn how theoretical models of the world differ from the world itself, and link theory with practice (Hanson et al., 2009; Belu & Husanu, 2012).; Some of the papers in the study compared the learning experiences in ‘hands-on’, remote and virtual labs, assessing the strengths and weaknesses of each mode (e.g. Ma & Nickerson, 2006; Lindsey & Wankat, 2012). In a remote laboratory where the student and the apparatus are physically separated and there is no tactile interaction with the equipment, there are limited opportunities to teach practical skills or craft (Hanson et al., 2009). Yet, many laboratory experiments are already mediated by computers (Nickerson et al., 2007; Corter et al., 2011) so conducting an experiment through a computer interface is part of the learning experience. Individual ‘hands-on’ experience of using the equipment to collect data is thought to enhance understanding and better recall but this is not always possible in a physical laboratory because of time and space constraints. However, individual interaction is easier to facilitate in remote and simulated laboratories (Ma & Nickerson, 2006). This opens the possibility of ‘learning from failure’ as remote and simulated experiments can be repeated (Stefanovic, 2013) which is particularly helpful for less-confident students who can explore and make mistakes privately and in their own time. Like a ‘hands-on’ lab, a remote lab can provide a ‘real world’ experience of dealing with uncertainty and ‘noise’ such as, vibration or friction or confounding factors in experiments. Furthermore, complex experiments where the outcomes are uncertain may be more motivating than ones where the outcomes are known (Nickerson et al., 2007), but these conditions of uncertainty and ‘noise’ factors are difficult to replicate in a virtual or simulated lab experiment (Hanson et al., 2009). Thus the materiality of the remote laboratory, whether the experiment entails physically manipulating equipment from a distance or remotely gathering real data from physical equipment, offers significant advantages over the entirely digital virtual or simulated modality in terms of learning.

The importance of a sense of presence, e.g. telepresence, social presence and/or immersion

The importance of a student’s sense of immediacy and control over remote laboratory equipment is implicit in many, if not all, of the papers we reviewed. Several of the papers (Abdulwahed & Nagy, 2008; Ashby, 2008; Bauer et al., 2008; Hanson et al., 2009; Ma & Nickerson, 2006; Nickerson et al., 2007) use the terms ‘presence’ or ‘telepresence’ in considering students’ sense of ‘being there’ in or with remote laboratories. Presence, though, is a rather slippery concept, as is reflected in the use of the term in our literature sample and this is compounded by differing use of terms. Abdulwahed and Nagy (2008) and Bauer et al. (2008) use the terms ‘virtual presence’ and telepresence as a rather general term to describe a sense of involvement or realism by computer-mediated remote access to laboratory

experiments. Ashby (2008) and Nickerson et al. (2007), however, distinguish between a sense of 'being there' with the laboratory equipment (which they termed telepresence or physical presence respectively), and social presence as a sense of 'being there' with other people, typically other students in laboratory group work. This use of the term 'social presence' to refer to a sense of computer-mediated presence with other people has a long history in studies of computer-mediated communication since the 1970s (Short et al., 1976); it is of particular interest here because of the importance of team-working in laboratories as a desirable learning outcome.

Nickerson et al. (2007) suggest that both social and physical presence may be important in the design of remote laboratories. The importance of physical presence seems to be a general implicit assumption among the remote laboratory papers we reviewed, though not always articulated explicitly. We can, though, broadly distinguish the understanding of both categories of presence into understandings which relate it directly to the types or amount of physical sensorimotor opportunities to interact with equipment or people (e.g. Lindsey & Wankat, 2012; Morton & Uhomoibhi, 2011) on the available technologies. The more subjective understanding is evident in Ma and Nickerson's (2006) consideration of the difference between the relationship between laboratory work and the real world, and students' beliefs about that relationship. The relationship between the specifics of a technology and the sense of presence generated in a particular setting has been widely debated in social studies of computer mediated communication (e.g. Spears & Lea, 1992); that the relationship is not simple is perhaps suggested by student behaviour in trading of one form of presence (moving from video to audio interaction with peers in order to free up screen 'real estate' to make interaction with experimental equipment (Bauer & Mendes, 2012).

The locus of control in, and responsiveness of, the hybrid system

As previously discussed, active involvement is important in learning so, therefore, the locus of control in laboratory experiments needs consideration. In some contexts remote labs are used in lectures to demonstrate the real world experiment e.g. the TriLab system (Abdulwahad & Nagy, 2008) where a lecturer demonstrates a remote lab process control experiment as preparation for students. However, remote labs do permit students to run experiments as would be the norm in 'hands-on' labs but parameters need to be set up to allow the different types of control.

Responsiveness of the lab systems we examined varied according to the technologies involved and other technological limitations such as how many students can access the system at the same time and network bandwidth. Seeing the results of an experiment is important feedback to students and a means of reinforcing learning. The time interval between conducting a remote experiment and the student receiving the results will impact on the learning experience. In some systems, batch processing (Nickerson et al., 2007) is used so the students receive their result at a later stage once all experiments have been run. In other remote labs the graphical user interface (GUI) of a remote laboratory is designed to provide 'feedback' to the user in terms of directly controlling real instruments at a distance, an experience which can be

supported by a live webcam feed showing the effects of the student's actions (Matochka & Nedic, 2006). In interactive experiments such as in the vortex tube system described by Belu and Hasanu (2012); the lab system is committed to a single user during the experiment. This involves a scheduling or queuing system so that each user gets access which is similar experience to a 'hands-on' lab. However, student can then control the lab hardware, perform real measurements, sensor tests and calibrations, and remotely see temperature, pressure and flow variations in real time. In another example involving a queuing system, ReLOAD, (Hanson et al., 2009), students can choose parameters on some experiments and completed results are returned to the student's web page. The delay is a matter of seconds and is dependent on length of experiment and numbers of students attempting to operate the experiment. Internet bandwidth is an important consideration in controlling remote experiments and impacts on responsiveness. Some systems are rival in the sense that only one remote user can carry out the experiments at one time e.g. Bauer et al. (2008) explain that, while many users can observe experiments in PEMCWebLab at a time, access may be slow and only one user at a time can actually control the experiments. Other set-ups allow multiple users at the same e.g. RePhys, the lab for biomedical and physiological systems studies under development (Barros et al., 2013) in which many students will be able to access the equipment independently and run their own experiments.

Conclusions

This study explored 'hybrid' digital material networked learning as an emerging area of interest for SET education. Our review shows that the literature is biased towards technological and descriptive reports, with fewer pedagogical and evaluative studies. This implies that the field is still maturing, with practitioners currently focusing on practical matters required for implementation. Our observations indicate that the terminology is still developing and there is not a clearly defined, shared language in the field. One term that has gained currency, however, is 'remote laboratory', with such systems being particularly prevalent in engineering education. From an in-depth review of a subset of papers, selected for pedagogical and evaluative quality, we identified three themes – the importance of real data and authenticity in learning; the importance of a sense of presence and the importance of the locus of control in, and responsiveness of, the hybrid system. Although these observations have emerged primarily from the remote laboratory literature, they can be used to inform wider work in the field. These new digital 'hybrid' pedagogies allow us to view more traditional material pedagogies, e.g. lab-based learning, and purely digital pedagogies, e.g. virtual labs, through a new lens. Issues of authenticity, presence and control/responsiveness will also be of pedagogical importance to other 'hybrid' systems, such as those involving the 'internet of things' and ubiquitous computing. These issues are likely to be of growing importance.

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ONLINE DIGITAL GAMES AND EDUCATION FOR SUSTAINABLE DEVELOPMENT: A CONTROVERSIAL RELATIONSHIP?

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Introduction

Education for Sustainable Development (ESD) is linked not only to institutionalized form of education but also to informal settings, offering students the opportunity to come into contact with various sustainability issues and develop relevant knowledge, attitudes and values. It is worth mentioning that informal learning arises from the activities and interests of a person, namely not only through the use of printed material, the Internet and a computer, but also through every-day practices such as games (Sefton-Green, 2013). Since the early stages of ESD, games have been proposed as an alternative instructional method (Taylor, 1983). Computer and video games attract increasing interest among ESD educators due to their potential to support learning, especially among adolescents. Knol and de Vries (2011) argue that this particular age group is proficient at multitasking, prefers visual information over textual, is cross-media oriented, and is highly active on social network sites.

The success of digital games is an open research field in literature (Boyle, Connolly, Hainey & Boyle, 2012). Dowell (2007) argues that digital games are compelling because they reflect essential aspects of our cognition and culture (i.e. the ability to respond rapidly to uncertain visual stimuli, use of stories). The effects that digital games may have on users and especially on children have been largely explored. Most research on online web-based games concerns serious games rather than entertainment games. Serious games are video games with an educational nature, for use in formal educational settings as well as at home (Annetta, Minogue, Holmes & Cheng, 2009).

In the last years the number of ESD serious games has grown exponentially (Liarakou, Sakka, Gavrilakis & Tsolakidis, 2011). Several studies provide evidence that serious games can effectively contribute to awareness rising, concept construction and the development of positive attitudes towards sustainability issues (Liarakou, Daskolia & Papanikolaou, 2012; Knol & de Vries, 2011). However entertainment games have larger audiences than serious games because they offer the opportunity to the player to move freely, to work with others and develop his/her creativity of (Boyle et al., 2012). Despite the fact that these games are entertaining, this does not preclude the fact that they offer effective learning experiences

(Boyle et al., 2012). As Dowell (2007) argues learning cannot be not delimited by the bracketing of games into those designed for pleasure and those designed for education.

So, despite the previous negative review regarding the use of digital games and their impact on children, research today argues that these games may constitute useful pedagogical tools (Durkin & Barber, 2002). In fact the perspective taken on non-serious games has been invariably of negative learning while the possibility that positive learning may be acquired has received negligible attention (Dowell, 2007). Research has shown that users believe that these games broadcast nonviolent messages and give way to eliminate their negative emotions (Dyck, Pinelle, Brown & Gutwin, 2003). In addition they learn to interact with other players (Dyck, Pinelle et al., 2003); they develop analytical and spatial competences and strategic skills (Mitchell & Savill-Smith, 2004); they have robust links with their families and they are also involved, more than other children, in free activities (Connolly, Boyle, MacArthur, Hainey & Boyle, 2012). It is worth mentioning that entertainment games broadcast social messages and health messages to players, such as those against adolescent obesity (Altamimi & Skinner, 2012).

Therefore, since the engagement of children with online entertainment games is one of their most popular activities, it is important to explore what children learn with these games and especially what do they learn concerning sustainability. In this study we investigated what kind of messages children of high school perceive when playing three of the most popular online games and whether these messages facilitate or prevent sustainability. In particular, how do they perceive and interpret such messages? Which kind of knowledge, attitudes and values related to sustainability children develop through these messages and to what extent they influence their real lives?

Methodology

A qualitative research approach was used to explore the messages perceived by the respondents. The selection of a qualitative approach is based on: (a) the shortage of relevant studies and data that indicates a rather unexplored research field and (b) the need to dig in depth the perceptions of a rather small number of users (Cohen, Manion & Morisson, 2007). Although this choice prevent the generalization of the findings, it allows the emergence of every possible perception and interpretation made by participants and later on the preliminary formation of basic categories which would guide future research.

The study was developed into three phases. At the beginning 54 high school students (13-15 years old) of the island of Rhodes in Greece were provided with a brief questionnaire in order to report which online games they prefer. In the second phase among the most popular games, we chose the three most complex strategy games, namely the Call of Duty, the Minecraft and the League of Legends, to be further investigated. These games were carefully explored, through a long empirical study, to clarify possible messages concerning ESD, and to prepare an interview guide. The main questions of the interview guide were related to the three dimensions of sustainability (i.e. environment, economy and society). In the third phase

15 high school students were selected. A purposive sampling approach was used (Cohen et al, 2007) so as all of them to be experienced on the three games. The sample consisted of 3 children of the 1st class, 5 of the 2nd and 7 of the 3rd class of high school. Individual interviews were conducted and qualitative content analysis was applied to interpret the data.

Results

In the next sections the results of the analysis of the three games are presented.

Call of Duty (CoD)

The game has many different versions, with different scenarios; all of them constitute representations of a war between the US and the Russian army. Often players are also confronted with terrorists who kill civilians. The player aims at killing the opponents and simultaneously avoiding death. Usually the game consists of 5-member teams. It is very important that players use weapons of the latest technology. The game's graphics are of high resolution and full of realistic elements (people's representations, cities, mountains, camps etc.).

The messages emerged from the analysis of this game were classified into two categories: social and environmental. Furthermore the emotions experienced by the researchers were compared to those experienced by the respondents.

With regard to social messages, it seems that although children obey to the rules of the game, they don't lose their ability to recognize whether the elements projected are realistic and socially acceptable or not. For example, occasionally the game requires players not to kill civilians, a rule that is acceptable from every child both in the game and real life:

"A: ...you should kill enemies rather than people who do not blame you for nothing."

The main purpose of this game is that players should kill as many opponents as possible. Although children enjoy taking other players' characters life in order to win, they also realize that this is unacceptable in real life. Furthermore, only one of them would be willing to go to war, and this is because of patriotism. In addition, the game presents the Americans as heroes and the Russians as evildoers. Considering that most respondents understand that this is not true in reality, the game cannot predispose them positively or negatively:

"A: I do not know who the good guys are and who the baddies are. Nobody is good or bad. They are just rivals."

It is also important that the game encourages teamwork. In this study it was reported that the most players collaborate with their teammates. The reasons vary, but almost all are designed to win the game:

"A: I prefer to win and this is done with teamwork."

On the other hand, in some cases the children come in contact with concepts which they are not familiar, so they cannot judge whether the game presents them in a right way or not. More specifically, although the concept of terrorism is used within the game, it isn't associated with its proper meaning. As a result several respondents cannot describe with certainty what a terrorist is and if terrorists are realistically presented in the game:

“Q: What do you think of terrorists in real life? Do they have any relation with those in the game?”

A: I'm not sure. However I think there is a difference. It is not the same in reality.”

Sometimes the player is confronted with situations in the game which pose some kind of ethical dilemmas. When they are faced with such questions, most of the children decide according to the interest of the group, and in particular the salvation of friends in the game.

Although the scenery of the game is very realistic, the environmental processes seem to be unrealistic. For example, although players use high tech weapons, the game's environment is not affected or damaged. Most of the respondents were able to perceive that this doesn't happen in reality:

“A: The nuclear bombs for example, destroy the environment and infect people.”

Finally feelings experienced by researchers in comparison to those of children are quite different. While the researchers felt mostly negative emotions, children were more positive. It is noteworthy that when children were asked whether they agree that the game (rated by the ESRB) should be played by youths over 18 years, all of them disagreed:

“...no one needs to be 18 years old to see some things that can be seen when living in an ugly area or in the street ...”

League of Legends (LoL)

Players in this game are called Summoners and fight within the Fields of Justice, organized into five-member groups. Their aim is to destroy the opposing team's nexus (energy source). At the beginning, each player has to select its champion (appearance and features) among 116 different ones. Players are provided with or have to find and acquire several tools (Runes, Masteries and Spells) that offer different advantages and support. In the battle, summoners can buy various items being at the shop near the summoner platform with the gold gathered during the battle. The game's graphics are of high quality but they don't depict human figures or real locations (a fantastic world consisted of forests, enchanted cities, lakes, jungle etc.).

The messages emerged from the analysis of this game were classified into two categories, social and economic messages and, once again, emotions were also reported.

The respondents show a particular interest for social messages put forward by the game. First of all, children reported collaboration once again, with more emphasis than in the CoD. However, collaboration is not considered only as a way to win. The children also prefer to play with their friends, rather than with strangers, for safety and socialization reasons:

“A: If you have a team to play, the game is not just a game; it becomes a game of collaboration. You win only through collaboration.”

“A: Due to this game I have met some children from the 1st, the 2nd and the 3rd Lyceum class of my school. They talked to me when they saw that I was playing well.”

In parallel, the concept of solidarity is also promoted. Often in five-member groups, there are beginners. Although not playing very well, the other players do not leave them alone and do not insult them for their mistakes:

“A: Anyway, I will support him unless he purposely doing bad. And I say to him ‘never mind, do that, try not to play so aggressively’ and so on. The game’s rules also stress this tip, i.e. if you help your partner he will probably play 20% better, so I try to do so.”

Players regard the helping of weaker players as very important; so they argue that they would do so in real life.

There are also some servants programmed by the system to move forward from the player in order to protect and actually to be sacrificed for him. In terms of real life, most respondents believe that there are some people with fewer rights than others, something that they are totally opposed:

“Q: How do you feel about this?”

A: Shame for mankind! Something should be done about this. Now I do not know exactly where it occurs but...”

As in the CoD, players must end the lives of other players in order to win. Although in this way they progress in the game, some children would prefer to imprison their opponents rather than kill them. Others believe that in this way the game would not have fun, but certainly in real life all would prefer a guilty person to be imprisoned rather than executed. Additionally, the players develop a sense of responsibility as they cannot leave their teammates in the middle of a battle without a good reason because they will be penalized with exclusion from the game for a few days:

The economic messages disseminating through this game relate to purchases that children can make using either gold, gathered during a battle, or real money. It was observed that some children consume more items than needed, since the game prompts them to spend their gold. The children stated that they also have consumer trends in real life:

“A: I seek more to spend my gold. In this way you try to get better.”

“A: You buy what you want, but always you want something more; this is in human’s nature; and you say okay, I have the financial ability so let’s get this and I’ll find something to do with it!”

Players can buy costumes with real money to change their appearance. At this point, respondents also showed signs of consumerism since they gave real money to buy such costumes:

“A: You like it and you show around what you got; but it’s also nice because you see that your champion has a visual difference.”

In the same manner, in their real life children believe that the appearance also plays an important role:

“A: Yes, in real life I think it’s important because dressing somehow shows to the others what your character is. I think it is nice to be dressed in a beautiful way!”

What is striking here is that none of the respondents would like spend real money to buy items that would help them to win the game. According to them, it would be unfair for children with limited economic power, and it would be boring for someone to win because of money and not due to his/her competence:

The feelings generated in children, are close to those experienced by the researchers. There are feelings of anger, anxiety, and excitement. For instance, a child said that it takes pleasure because through this game it can help his friends, an opportunity not given in real life:

Minecraft

In this game players have to place and break blocks. For this reason it is called ‘the electronic Lego’. Players can work together to create wonderful and imaginative things. The game has two modes. In the first (Creative), the player has the ability to create things while in the second (Survival) faces monsters and uses what he/she has constructed during the fight. Instead of different levels this game switches between day and night. The graphics of the game are quite low but its environment is very peaceful (forests, a green valley with flowers and many animals, the ocean etc.), at least during the day.

The data gathered from the third game were divided into three categories; social, economic and environmental messages. Knowledge acquired concerning natural resources and the feelings of players were also examined.

Concerning social messages, collaboration aiming at winning the game and communication with other players emerged once again. However, in this game collaboration is also associated with creation:

“A: I prefer to work collectively because together with others we can create more beautiful and bigger things.”

Players create a community based on their own imagination. This is the reason why players develop creative thinking and autonomy during playing. All players stated that their constructions were based on improvisations. However, sometimes children are likely to see something in real life or on YouTube that catches their attention:

“A: Sometimes I make something that I saw on the Internet and want to see if I can manage to make it by myself.

Q: Do you try to construct exactly the same?

A: Not the same but similar. The main frame can be the same.”

On the other hand, during the nights in the game (the daylight lasts 20 minutes in total) there are some monsters that attack the players and try to kill them. In these cases, the players have to kill for self-defense. This process makes the players even more creative as they try to protect themselves. Among all these creative and constructive procedures, there are also some which are likely to positively influence children in real life. For example, players can create their own farm and cultivate plants, fish, breed animals etc. It seems, however, that most children understand that such procedures are not as simple in real life as they are presented in the game:

“Q: Would you like to get involved in some of these economic sectors?

A: No. Because in real life the time needed isn't the same and sometimes you may not harvest the crop, while in the game you always manage to.”

Furthermore, the critical issue of consumerism has also been emerged. In order for the players to create their constructs they have to gather raw materials found in the game environment. Whenever most of the players find a potentially useful material, gather it without a second thought, even if it isn't needed. Some children realized that players show an improvident consumerist behaviour in the game, while all of them believe that consumerism should not exist in real life:

“A: Yes we should not over consume without a reason. In Rhodes, let's say, we have many unfinished houses. People have made the plan, the columns, the frame but the buildings have never been finished and they remain incomplete for many years ... It's a shame; these constructs spoil the image of Rhodes and many raw materials have been consumed for nothing.”

However consumerism doesn't affect the game's environment. No player observes any particular environmental damage, despite the profligate use of natural resources. Nevertheless most respondents stated that such damages are evident in the real environment. They believe that natural resources are actually limited:

“A: In reality there are limitations. We cannot draw raw materials continuously. For example, considering the quantities we draw, the oil can be exhausted. However in Minecraft the world is so large that there is an infinite amount of things.”

This game also provides a lot of information on various topics that children may not acquire during their formal education. This information, however, may not correspond exactly to reality, in terms of time frames, representations etc. No child was able to describe precisely, for example, the extraction process of diamond, the glass production process or what exactly a sheep can provide. They learned however that diamonds, in comparison to other minerals, have the most difficult mining process, glass is produced by sand, a sheep provides wool, meat and milk.

The emotions reported by the researchers and those expressed by the children were quite similar. Both positive and negative emotions have been emerged. While the construction caused satisfaction, the battle against monsters provoked stress, anger but also pride for the victory.

Discussion

Considering that sustainable development consists of three interrelated dimensions, namely environmental protection, economic efficiency and social justice, every kind of educational process that promotes or deals with messages and values consistent with these dimensions potentially contributes to the vision of ESD. Online entertainment games constitute a noteworthy kind of informal education since their pedagogical role has been increasingly recognized (Durkin & Barber, 2002). The present study demonstrated that three of the most popular such games involve indeed social, environmental and economic messages. Even if the perception and the interpretation of such messages differ among children, they should not be underestimated for their role on ESD.

It is obvious that the majority of the messages reported are associated more with the social rather than with the environmental and economic dimensions, even if some of them encompass more than one dimension. Teamwork, collaboration and solidarity are among the most evident messages/values promoted through different ways. Within this context, interaction, as a basic feature of online edutainment games (Prensky, 2001), is evident across the three games, since the majority of players prefer to play with friends. These games promote socialization as well as mutual support, even with beginners, aiming at achieving a common goal. Such features and values are expected to guide children's attitudes also in real life. The values of life and equity also emerge implicitly or explicitly throughout these games. Children seem to be able to distinguish some negative perceptions, tasks and behaviours required to win a game from what is moral and acceptable in real life (e.g. racist perceptions, killing people, having servants). At the same time players seem to become creative, imaginative, autonomous and able to deal with complex situations themselves.

The unreal representations of these games might confuse users with regard to environmental conditions and potential degradation. In two out of three games (CoD and Minecraft) the environmental dimension is quite clear. However, although the behaviour of players in the game would cause serious damages on the natural or human environment, in the unreal setting of the game everything seems to be unharmed and unlimited. As with many games providing players with many “lives”, here the environment seems to be regenerated. Fortunately in this study users realize that the real environment is more fragile.

Moreover, such games, and especially the Minecraft, help children to come in contact with economic sectors which are essential for sustainable development such as farming, agriculture and extraction of natural resources. Although the knowledge provided is shallow, some basic aspects are useful, especially for children living in urban areas.

However, the dominant message emerging from LoL and Minecraft, that corresponds both to economic and environmental dimensions, relates to consumerism. Both of these games do not prevent players from acquiring a wealth of resources, materials and tools even if they are not needed. Without setting limits (e.g. economic, natural, moral), these games indirectly promote consumerism. In terms of appearance, children seem to adopt consumerist attitudes and accept that dressing is important in real life although they consider that giving real money to buy costumes is unfair in the game (LoL). Additionally, it is very interesting to note that children seem to be sensitive with regard to over consuming of some materials, a practice that degrades environmental aesthetics and exploits natural resources (Minecraft). However, this is due to personal experiences of their town. We could assume that both games and real life experiences influence in conjunction children’s perceptions, values and attitudes. It seems that both real and virtual experiences influence their decisions, and sometimes probably in a contradictory way.

In conclusion, we consider that, in the light of a constructivist approach, online entertainment games constitute a significant link of an informal education chain which should be taken into consideration. The games examined through this preliminary study have various messages – positive or negative – linked with all dimensions of sustainable development. That is why the exploration of such games in the context of ESD should be further promoted. The present study focused on some basic ESD aspects, namely the content and messages promoted, of three popular games. A more detailed study, focusing both on pedagogical approaches and the interaction of game’s and real experiences of users would reveal further useful aspects of the pedagogical role of these games in relation to ESD. Research should also involve quantitative approaches, by examining more games and involving a broad sample of children so that findings can be generalized. The participants of this study were children from middle class families. Future research should also involve children from families having a wide range of social features so that useful comparisons can emerge.

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THE ONLINE LEARNERS IN MOOC SOCIAL ENVIRONMENTS

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Background

Massive Open Online Courses (MOOCs) are the latest revolution in online teaching and learning. The world's leading universities, such as Stanford, Harvard, and MIT are offering MOOCs to the general public, worldwide, without any preconditions and free of charge (Johnson et al., 2013; Allen & Seaman, 2014; Adams & Williams, 2013; Stewart, 2013). These MOOCs are offered by a variety of initiatives, such as Coursera, Udemy, MITx, edX, Udacity, and are taught by professors around the world, in various fields. They allow for flexible learning at any time and any place, integrating a variety of tasks into the course structure. A major emphasis is put on selecting suitable course subjects, instructors, high quality video production, and a friendly interface. These MOOCs may alter the conception of education and create a culture of collaborative social learning (Brinton et al., 2013; Kissinger & Bennett, 2014) combined with peer assessment (Balfour, 2013; Piech et al., 2013). This type of course development enables the teaching of MOOCs.

The literature emphasizes that MOOCs are based on active student engagement in accordance with learning aims and objectives as well as their early knowledge and skills (McAuley, Stewart, Siemens & Cormier, 2010). In online learning, Self-Regulated Learning (SRL) that is characterized by the ability to initiate learning and adapt to new learning methods (Bidjerano & Dai, 2007) is crucial. The learner is required to have the ability to learn independently and be self-disciplined (Komarraju, Karau, Schmeck & Avdic, 2011; Mackness et al., 2013). In addition, many researchers and educators (those who support the theory of connectivism) claim that most of the significant learning in online courses takes place through the sharing of information, and interpersonal interaction (Cormier, 2008; Downes, 2007; Bell, 2011; Siemens, 2014), which may occur in the forums offered to learners. Thus, social learning is a central theme of online courses and especially of MOOCs. MOOCs are based on technologies that enable students to learn independently in cooperation with other students. The main channel for this interpersonal interaction is the course website forums, in which the learning community can manage interactions on issues related to the course (but not necessarily). Hence, this study will examine the extent of forum usage in MOOCs and the patterns of students' activity using Educational Data Mining (EDM) and learning analytics methods to analyze the data accumulated in Coursera log-files. The objective is to produce significant information regarding students' activity in MOOC forums.

The presented study is part of a larger research that aims to characterize and promote effective online teaching and learning processes as well as assessment. In light of the claim that meaningful learning takes place through interpersonal interaction in discussion groups (forums) offered to learners, the fact that the percentage of participants in these discussion groups is lower than expected is not fully explained (Brinton et al., 2013). This study focuses on large-scale discussion groups operated in connection with one MOOC offered by Tel Aviv University through Coursera. MOOC forums were chosen due to the wide range of activity of thousands of students who registered for this course, and the findings of this study will contribute to the developing body of knowledge on learner communities in other online learning environments as well as academic fully online courses.

The aim of this study is to explore the students' participation patterns in forums and characterize them as well as to understand the factors that correlate with the students' participation in these forums. Furthermore, the correlation between performance on the final test and participation level in the forums was tested, too. Accordingly, the study questions were:

1. What is the volume of students' activity?
2. What is the volume of students' weekly activity?
3. What are the student participation patterns reflected in the forums?
4. What are the factors which may correlate to the level of participation?
5. Is there a correlation between forum participation and passing the course?

Methodology

The presented study is based on an analysis of empirical data concerning students' activity in 652 forums, retrieved in 2014 from Coursera log-files. These forums were created in connection to one MOOC that was developed by Tel Aviv University. 27,322 students from all over the world were registered for this MOOC. Coursera automatically accumulates a vast amount of data regarding students' activity in its server web logs. At the end of the course, the course log-files were obtained through web mining techniques. This enabled the retrieval of data regarding hidden traces of students' activity, which is continuously left on the course website.

The study was conducted in three stages:

1. **Data organization** – Using data mining techniques, hundreds of thousands of web log-file records regarding the 27,322 students' activity were extracted from Coursera web log-files and organized into two data-files. The first data-file contained variables regarding each student's activity in a specific forum (each row represented a different action). In this file, each student action was represented by an identification code (unique to each student), which allowed for simultaneous individual and **anonymous** global monitoring (due to privacy and ethical issues); the date and time of the activity; type (e.g., posting in forum, viewing posts/comments); and content. The second data-

file contained summative variables and nominal variables that characterized the learner (each row represented one student). The summative variables calculated activity intensity and views, and their values addressed the timespan of the entire course as well as each week separately. For example, data might have included the number of student posts, number of student comments (reply messages), number of posts/comments in relation to other students, number of evaluation points, and number of tags he/she used as well as the device he/she used, geographic location, etc. Notably, we were committed to protecting student privacy. Student names and e-mail addresses are regarded as personally identifiable information (PII); they were handled very carefully and were not included in research data exports.

2. **Identifying patterns of students' activity** – The second stage focused on analyzing the web log-file records regarding the students' activity in 652 forums. Learning analytics of these log-file records were conducted to identify patterns in students' activity. The raw data was analyzed in stages. In the first stage the posts and the messages were processed in order to perform an initial qualitative analysis. Then, the course meta-data and relevant key student profile parameters were incorporated to generate insights based on unseen correlations. Several variables were calculated in order to characterize the students' activity in the forums such as type of participation (e.g. active: post and/or response, passive: just watching, lack of participation); scope and extent/intensity of participation (e.g. number of posts, depth of discourse – responses for discussion); giving/receiving points for messages; number of participating days; using tags; and characteristics of the messages/texts. In addition, types of devices and operating systems used by students (mobility characteristics) were included variables that were calculated.
3. **Correlation analyses** were conducted among variables that characterized the activity in the forum. In addition, the correlation between these variables of participation, finishing the course successfully, and students' location were tested.

The field and the population

The field of the study included 652 forums which were offered to 27,322 MOOC learners from around the world. These forums were operated throughout the semester. The learners' distribution by geographic location is presented in Table 1.

Table 1: Learner distribution by geographic location

Countries	Students
United States	23,427
Europe	2,223
Asia	1,287
Africa	166
Australia	143
Pacific	34
UTC	30
Atlantic	5
India	4
Antarctica	3
Total	27,322

Research tools and data analysis methods

The following data mining tools (quantitative and textual) were used in this study: a log-file information retrieving tool; two data-files for presenting the data in a relational database to be cultivated; and statistical tools.

Quantitative and Qualitative methods were used to achieve the goals of the study. Data regarding the students' activity in the forums was organized in a relational database. This initial step helped in structuring the data and identifying relevant relationships among all the key parameters. Also, the structural data enabled us to generate a matrix of variables to use in examining the correlation between the various student activity variables. Analysis was used for clustering and identifying the patterns of student activity/participation based on defined criteria. In addition, qualitative text analysis was generated on the posts and comments.

Preliminary Findings

Volume of students' activity

652 forums were initiated on a variety of topics. Of the 27,322 students registered for the course, approximately 4,500 registered to use the course's forums during the course, and only 1,257 of them were active in the forums throughout the entire course. The following analyses were conducted on these 1,257 learners. Table 2 presents preliminary data regarding the volume of activity in the forums with respect to: number of forum views; number of posts (messages written on the first level), number of comments (responses to posts – second level, and up); number of evaluation points given by the students; and number of tags used.

Table 2: Volume of forum activity

Activity Type	Volume
Number of forum views	103,848
Number of posts (first level messages)	4,949
Number of comments (second level messages, and up)	4,598
Number of evaluation points given to the messages	4,537
Number of tags used	491

Volume of participation in relation to student's geographic location

The MOOC was attractive to a large number of participants from different countries, especially from the United States (86%), Europe (8.1%) and Asia (4.7%). Table 3 shows the percentage of participants from each country, and it is interesting to note that a similar percentage of students from each country participated in the forums.

Table 3: Participants' geographical location

Country	Participants	Percentages
United States	1011	4.32
Europe	139	6.25
Asia	85	6.60
Australia	13	9.09
Africa	6	3.61
Pacific	2	5.88
UTC	1	3.33
India	0	0
Grand Total	1,257	39.09

The overall forum activity conducted by those countries, who “participated” in it, was interesting. The ratio between the volumes of views versus posts/comments is very prominent. Australia is unique in that respect; the students played a balanced role in both writing and viewing during the course (Figure 1).

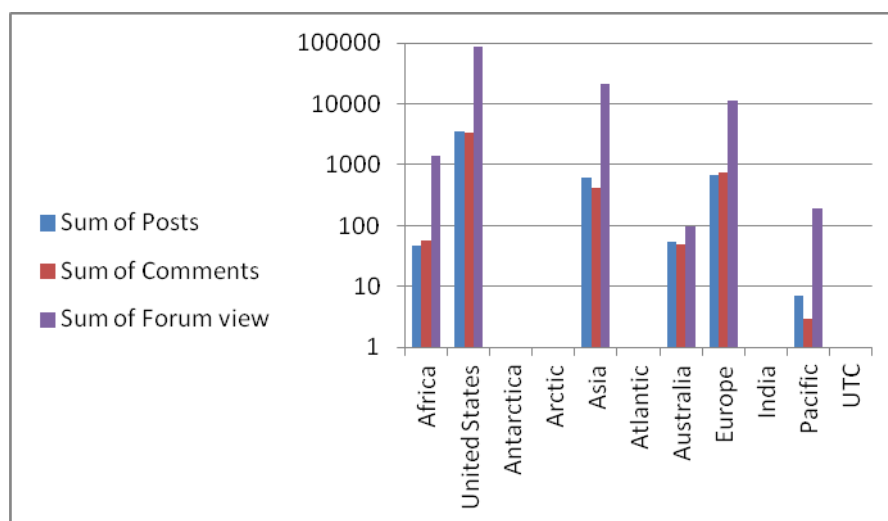


Figure 1. Students' activity by country

Volume of students' weekly activity

The analysis of the volume of students' weekly activity was only conducted on the 1,257 learners who were active in the forums throughout the entire course. Students' activity was explored using three key variables: number of posts, number of comments, and number of views. During the course, the same downward trends appeared regarding comments, posts, and views; though the volume of views throughout the course was, by far, much higher than the number of posts and comments. In the first week, the amount of views was 22.5 times higher than the amount of posts. On a weekly basis, posts and comments shared the same

average. Interestingly, weeks 13 and 17 were unique in that their number of comments was fairly higher than their number of posts.

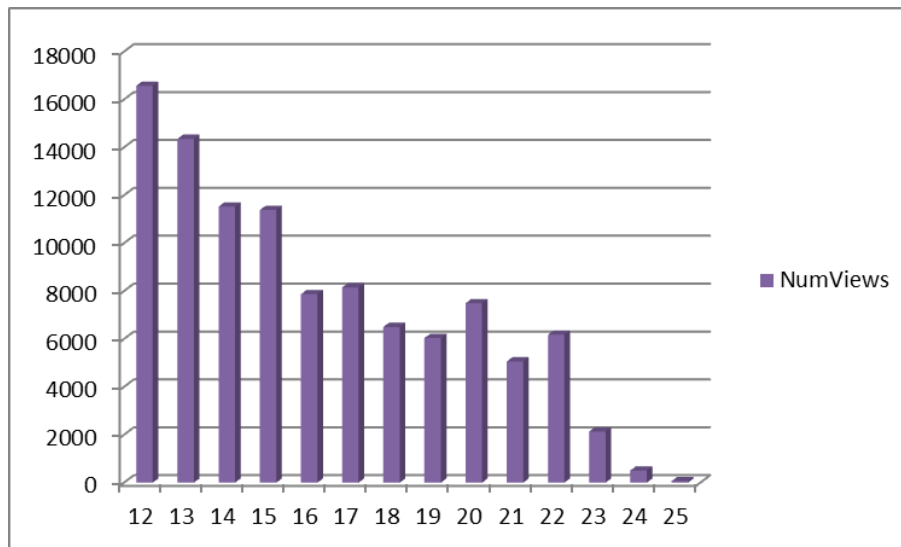


Figure 2. Number of views by week

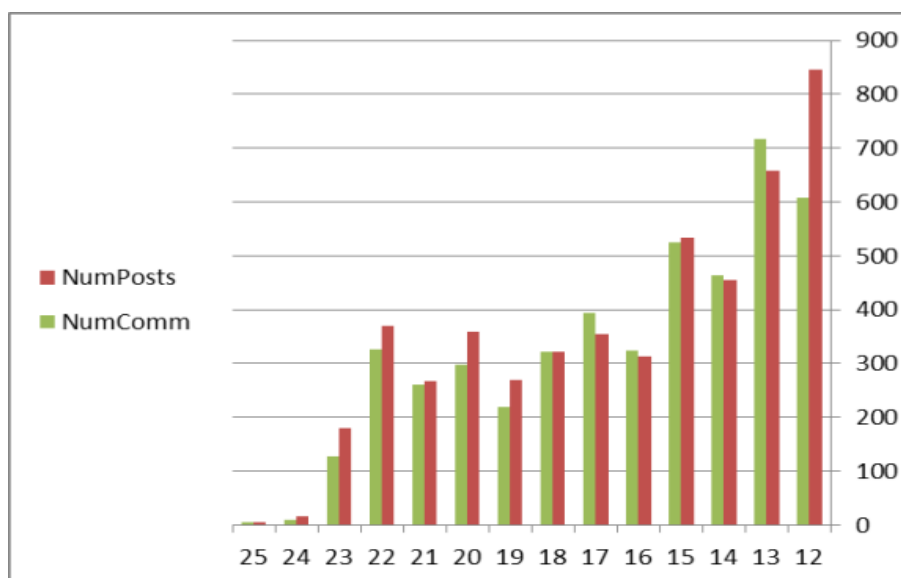


Figure 3. Number of posts and comments by week

Participation patterns of students as reflected in the forums

27,322 students were registered for the MOOC, 4,500 were registered to use the forums, and only 1,257 were active in the forums. Furthermore, when the data was reviewed at the student level, it was surprising to see that three quarters of students were hardly active. Most of the activity came from one quarter of the students who wrote 3 – 266 posts, wrote 2 – 279 comments, and had 18 – 7,013 views in the forums.

Taking a deeper look at student activity, we identified those who chose only to “view” and not to interact with their peers. Especially during the first couple of weeks, most students just “watched” and were “off stage”. The number of students who just watched during the first week was 5 times higher than the number of students who had written posts that week.

During the last two weeks of the course, activity reduced to zero (weeks 24, 25). Figure 4 shows that more students wrote posts than comments (responses to posts); on average, 1.76% more. Each student wrote an average of 2.2 posts compared to 3.7 comments during the course. We can assume that some posts created chain reactions of follow-up comments.

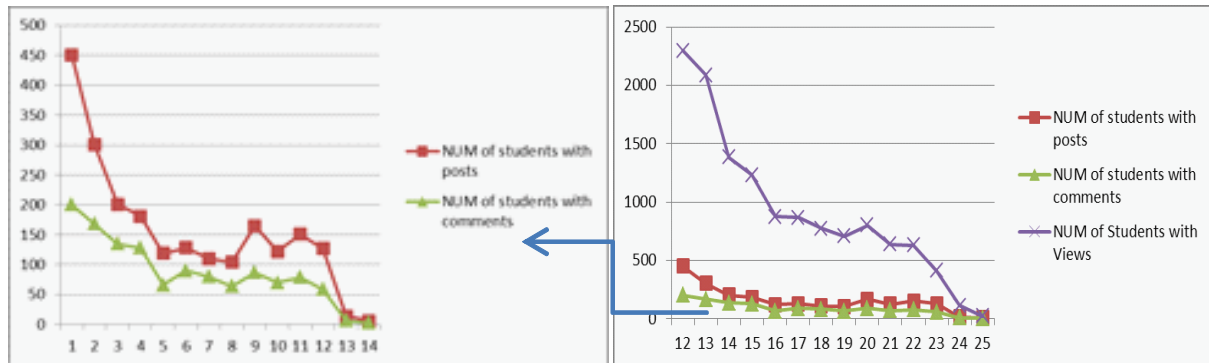


Figure 4. Number of student posts, comments, and views

In order to locate groups of learners with the same patterns of activity in the forums, Two-Step Cluster Analysis was conducted. The included variables were: sending posts, sending comments, viewing messages (posts/ comments), giving evaluation points to a message, tagging, and the device used while participating in the forums. Four clusters resulted, as shown in Figure 5. The second cluster (the activist-viewer) was the only group characterized as mobile users. The participants in clusters 1 and 2 were active, with the first cluster (24.9%) having a high level of each activity and the second cluster (25.5%) being characterized more as viewers. Clusters 3 and 4 had low activity, although cluster 3 (9%) was more reactive to others by writing comments and giving points of evaluation and cluster 4 (the largest cluster, 40%) did more posting, viewing, and tagging (Table 4).

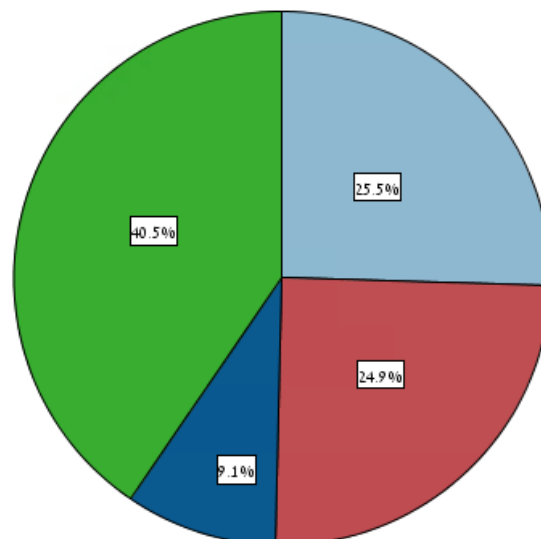


Figure 5. Cluster sizes

Table 4: Cluster descriptions (the colours represent the input (predictor) importance)

Cluster	1 “Activist – on the stage”	2 “Activist – viewer”	3 Low and reactive with comments and points	4 Low with views and tags
Size	24.9%	25.5%	9%	40%
Mobile/Not mobile	Not mobile	Mobile	Not mobile	Not mobile
Comments	2.75	1.67	2.15	1.00
Posts	2.32	1.78	1.0	1.45
Views	1.80	1.57	1.0	1.48
Points	10.33	2.19	1.05	0.95
Tags	0.78	0.38	0.01	0.24

Variables which may correlate with level of participation

Table 5 describes the correlation between key variables that characterize the activity in the forums. Significant correlations among all activity types (posts, comments, points, and tags) were found. Active students in the forum performed similarly in each channel by writing posts, providing comments, and tagging. However, there are no correlations among these variables and the students’ location or achievements (successfully finishing the course).

Table 5: Correlation among variables

	Comments	Forum Views	Points	Tags	Location	Achievement
Posts	.817**	.601**	.659**	.470**	.044	.197**
Comments	1	.641**	.475**	.381**	.045	.160**
Forum Views		1	.213**	.311**	.007	.064*
Points			1	.365**	.049	.176**
Tags				1	.034	.131**
Location					1	.138**

**P<0.01 *P<0.05

Analysis of forum activity using keywords

Observation of words used in discussion tags/posts/comments can be visualized using “cloud words”, as shown in Figure 6 (the number of word instances is reflected in the font size of each word). The cloud shows that intensive dialogue revolves around topics covered in the forums and related to the course subject (Modern Middle East). However, words related to learning management were triggered as well, including assessment (exercises, assignments, tests) and other components available on the course website, such as video lecturers and course pages. Students also discussed different tracks of study.



Figure 6. Keyword cloud

This paper presents preliminary findings regarding students' activity in MOOC forums. These findings may help in understanding social processes and supporting the adoption of discussion groups, both in online courses and other virtual spaces. The results of the study may clearly identify the characterization of the online learner (viewers versus posters), the definition of effective forms of online learning (relevant topics), and support the discussion of "Whether this is a new instructional method".

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BUILDING BETTER MOOCS: USING DESIGN PATTERNS FOR MASSIVE OPEN ONLINE COURSE DEVELOPMENT

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Abstract

The range and number of MOOC offerings has continued to expand and arguably, MOOCs have now established themselves as an important part of the online educational landscape. This paper outlines how a design pattern approach was used to bring experts together through the participatory pattern workshop methodology and to explore the successful design approaches that have been deployed to design and deliver Massive Open Online Courses. The resulting set of 19 design patterns are offered as a way for those charged with creating and delivering MOOCs to build on expert success and help design better MOOCs.

Introduction

The expansion in range and number of massive open online courses has led to a series of different approaches to their delivery, pedagogy, functionalities and support mechanisms. Some of these have been successful and others not so successful, for an example we have witnessed high variability in the documented retention rates across different MOOC offerings (Jordan, 2014). Some systemic reviews of the MOOC landscape are becoming available and we note that in a recent study of a selection of 76 MOOC offerings, Margaryan et al. (2015) found that the majority of the analysed MOOCs scored poorly on instructional design principles. The goal of the MOOC design patterns project has been to explore, define and articulate the emerging successful design principles and patterns that underpin the development and delivery of massive open online courses, and to put them forward for the design of new MOOCs. The context of the project has been ambitious. It adopted a multidimensional approach that incorporated input from diverse but complementary perspectives. These included designers, deliverers, researchers, learners and tutors who have been engaged in the area of MOOCs and Open and Distance Learning more broadly. The project was driven by a set of key questions that revolved around a desire to understand the design processes and mechanisms by which we come to create and deliver open and distance learning at scale and by extension how we can formulate this into sharable design solutions that can be applied by others. This is particularly pertinent where we are observing differentiation and varying degrees of success in the current landscape, reflected in:

- Delivery modes and platform choices;
- Style of MOOC (for example: 'x' versus 'c' versus 'p');

- Reported experiences of learners on MOOCs;
- Reported experiences of tutors teaching on MOOCs;
- Increasing use of motivational schemes such as micro-certification and badging;
- Retention figures.

The particular methodological approach in this project draws on previous work in the field of design patterns and pattern languages. The design patterns paradigm (Alexander et al., 1977) was developed as a form of design language within architecture. Several studies (Voogt et al., 2011; Ronen-Fuhrmann, Kali & Hoadley, 2008) have demonstrated the value of engaging in design for educators and extensive research over the last decade highlights the complexity of learning design and the design of learning technologies (Beetham & Sharpe, 2007; Mor & Winters, 2007). This complexity calls for novel approaches to the articulation, validation, sharing and application of design knowledge and here, design patterns can be viewed both as “solutions to problems” and also developed as a way to support theory-praxis conversations (Goodyear et al., 2004). Here a scaffolded approach using the Participatory Patterns Workshops has been adopted (Mor, 2013; Mor, Warburton & Winters 2012).

Methodology

The SNaP! (Scenarios, Narratives, and Patterns) methodology was implemented in the form of Participatory Patterns Workshops (PPW). The Participatory Methodology for Practical Design Patterns (Mor, 2013; Mor, Warburton & Winters, 2012) is a process by which communities of practitioners and experts collaboratively reflect on the challenges they face and the methods for addressing them (Figure 1). Participants share accounts of their experiences prior to the workshop series, which are formulated as design narratives, and collaboratively extract design patterns from these over the course of three workshop sessions.

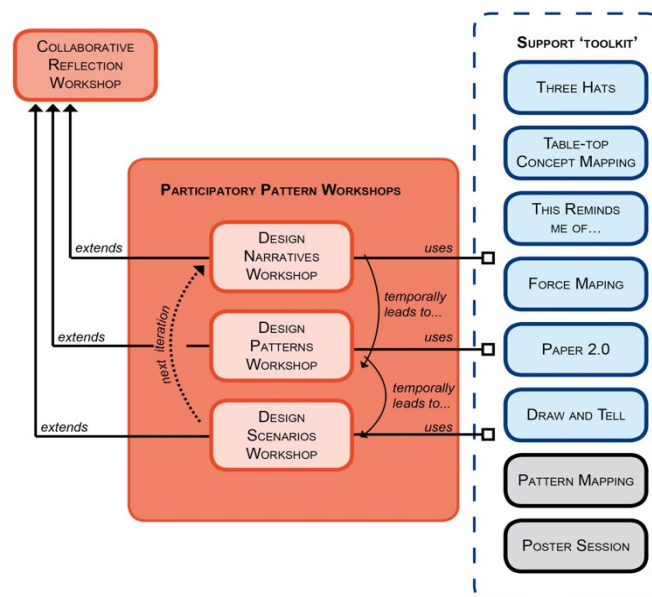


Figure 1. Overview of the participatory pattern workshop methodology with auxiliary support toolkit (from Mor, Warburton & Winters, 2012).

One of the strengths of the PPW methodology is its inherent flexibility in the style and format of the workshops. In this design patterns project an agile approach was adopted to promote a more rapid pattern development process:

- **Workshop 1:** Share design narratives and build proto-design patterns based, building on the 'Rule of Three', where possible.
- **Workshop 2:** Review and iterate design patterns; aggregate and map patterns; rapid validation exercise based on future design scenarios or challenges.
- **Workshop 3:** Selected design patterns are reiterated into publishable outputs via a writer's workshop. The aim being to finalise these chosen design patterns for public release, and to adapt elements to a set of learning design principles for future open online course development.

Throughout the workshop process a suite of online tools were deployed to support sharing and collaboration activities:

- Googlesites (www.moocdesign.cde.london.ac.uk) provided a flexible web presence to organise and engage participants in their journey through the PPW process.
- The Learning design Grid (www.ld-grid.org) provided a resource of tools and instructions to the approaches being used.
- Integrated Learning Design Environment (ilde.upf.edu/moocs) was used as an online tool to support the recording, sharing and editing of the design narratives, patterns and scenarios.

Results

Nineteen design patterns in alpha and beta (peer reviewed) state were developed over the course of the workshop sessions. They foreground particular areas of design interest such as design principles that allow the creation of 'participation pathways' adapted or adaptable to specific profiles of learners. The full list of design patterns is organised below.

Pattern Name (status) and Problem Space Description

1. FISHBOWL (beta) – In a traditional classroom setting, learners and teachers will occasionally pause the flow of educational activities and discuss their experiences, expectations, concerns – and any issues that have emerged. MOOCs do not have the capacity to entertain such interactions: learners are dispersed geographically, the numbers are too big for synchronous sessions, and the teacher to student ratio is such that personal interaction is severely constrained.
2. PROVOCATIVE QUESTION (beta) – Being present in a synchronous forum can count as participation but active engagement through some kind of interaction is not easy to engender. When you have a live chat room full of lurkers how do you spark activity? And by extension how can you flow this into an asynchronous online discussion space.

3. CHATFLOW (beta) – In an online environment both synchronous and asynchronous discussions occur. In synchronous discussions, for those learners who are unable to participate, it can become difficult as the historic context is often lost on later review. This can limit a learner's ability to engage with the discussion in a timely fashion as chat or forum posts get pushed down the list and effectively lost.
4. SPARKING FORUM PARTICIPATION (beta) – Helping learners to overcome an initial reluctance to post or visibly participate is critical where collaboration is needed or co-creation of learning is desired, as well as where interaction serves a supportive social function.
5. SHARING WALL (alpha) – With large and diverse student groups engaging with MOOC platforms it makes meaningful discussion difficult, because individuals may not get a response to their post. In these circumstances, there is a need for a mechanism which will support the sharing of ideas and lead to meaningful discussion. It is important for students to gain an immediate snapshot of the activity of their peer community which will stimulate their further practice, investigation and discussion.
6. DRUMBEAT (beta) – MOOCs are massive and so participants may not feel a part of a community. Often they feel their voice is not heard, and so they can feel disenfranchised and dissatisfied. In other educational contexts learners can have more regular and focussed contact with tutors that can help to overcome this problem. How can we create the sense of faculty presence in the course, without fragmenting the cohort?
7. CROWDBONDING (alpha) – How do we catalyse the formation of groups from a diverse learner cohort where collaboration is needed, or co-creation of learning is desired.
8. SIX MINUTE VIDEO (alpha) – You are aware that creating a full-length video of your lecture for online delivery is too demanding, from both a teaching and a student learning perspective. You cannot maintain your enthusiasm and passion for a full hour video and you know that student attention will drop dramatically at various points across a long single recording.
9. SEE DO SHARE (beta) – How do you introduce new concepts, tools or practices, in a way that would be accessible and meaningful, assess learners understanding, and facilitate the emergence of social constructs, with limited resources and large number of students?
10. KNOWING THE STORY (alpha) – Knowing what to do when studying a complicated discipline at a distance is not easy. There is a meta-narrative to study which encompasses the idea of a journey and transformation. How does the learner use this to his/her advantage? Inventing a new story is not always a useful exercise and is a risk.
11. BRING THEM ALONG (alpha) – With an open course the diversity of levels (i.e. previous knowledge) is likely to be very wide and highly variable. If you pitch at the wrong level you will lose people quickly. What can you do to bring along as many people as possible on the journey?

12. **SCAFFOLDED MOOC (alpha)** – A lot of content already exists on the subject matter that is being delivered. Time constraints mean that more time should be put into the aggregation, evaluation and contextualisation of existing content (e.g. OERS) than originating new content.
13. **CHECKPOINTS (beta)** – Interaction between participants is essential to the success of a social, non-linear MOOC. However, participants approach activities in a different pace, and sometimes even a different order, making it hard to synchronise their experiences. Some participants diverge into independent explorations branching out of the MOOC activities. Sharing these could enhance the social learning experience, but at the same time it makes synchronisation even harder.
14. **ADJACENT PLATFORMS (alpha)** – Platforms which support MOOCs are often used to provide places to share resources or bespoke tools to create learning objects. These can be used when the MOOC platform falls short.
15. **MOOC LEGACY (alpha)** – Can you extend the openness of your MOOC beyond the final assessment / closure point of course. Creating a legacy format for the course ameliorates this problem and facilitates expectation management for repeat sessions.
16. **KNOW YOUR AUDIENCES (alpha)** – The open nature of MOOCs means that the barriers to sign-up are low and therefore virtually anyone can become a participant. Yet when we design a course we often have a particular type of audience in mind. With a MOOC that becomes an impossible task. So who do we design for? How do we reconcile design with audience?
17. **BEND DON'T BREAK (alpha)** – In a MOOC setting, 'flexible' can potentially entail jettisoning the 'massive', the 'online' and the 'course', leaving just the 'open'. Which learners do you lose if you aren't flexible, and what part of MOOC do you lose if you are flexible?
18. **INDUCTION (alpha)** – Learners need to understand how to make the most of the MOOC structure. They come from diverse backgrounds, often with very different expectations of and drivers to complete the MOOC.
19. **ENGENDERING TEAMWORK (alpha)** – Teaching the MOOC team to work collaboratively requires action: create a plan that will gather and direct every party involved (academics, MOOC learning design team, librarian media production team, legal services) with a clear content and delivery strategy.

The MOOC design patterns have subsequently been organised into six design decision domains which represent the key decision areas integral to the majority of MOOC development projects (Table 1).

Table 1: MOOC design patterns organised by design domain

Domain	Patterns
Structure	Adjacent Platforms; MOOC Legacy; Bring Them Along; Scaffolded MOOC; Checkpoints
Orientation	Induction; Bend Don't Break; Know Your Audiences
Participation	Fishbowl; Provocative Question; Chatflow; Sparking Forum Participation; Sharing

	Wall
Learning	Knowing The Story; Six Minute Video; See Do Share
Community	Crowd Bonding; Drumbeat;
Management	Engendering Teamwork

Discussion

The outputs of this project have included a set of design patterns and a prospective pattern language to support the continued development of MOOCs in relation to the particular design challenges this form of ODL presents. It could be argued that the MOOC design space is still nascent and therefore the quality of patterns derived within this domain remains to be fully tested as expertise grows. However, the MOOC phenomenon has been built upon a long history of expertise and innovation in the domain of distance education and open learning. There is already substantial body of literature surrounding distance education that spans, for example, early work on transactional distance and the emerging impact of new technologies (Moore & Kearsley, 1996; Bates, 1995) through to modern approaches that acknowledge more open access to learning and the impact of the Internet on modes of study and innovations in pedagogy. For a broad overview see Moore and Anderson (2003) and the distance learning journal IRRODL (www.irrodl.org). Overall the PPW format has demonstrated how rich it can be as a source for generating design material. In the project a total 25 design narratives; 19 design patterns and 5 design scenarios have been created and further work is likely to extend and reformulate these. The preliminary pattern grouping into design domains has developed an organisational structure that draws these together and we already have a variety of pattern states, ranging from alpha to beta and shortly to release states. There is some overlap between the elements and this suggests some refactoring maybe needed, including linking in to related pattern languages, particularly those that fill identified, for example in the area around online assessment designs. Currently, meaningful formative assessment at scale is an area of interest for all MOOC providers. The oscillation between the design pattern generation and the designed output via design scenarios has been an important iterative move in validating and refining the patterns themselves. This opens the pattern to scrutiny as a design object and allows for others in the design community to input their expertise and resource.

Conclusion

The PPW approach has demonstrated itself as powerful methodology for coalescing and abstracting expert knowledge. But this has come at a price in terms of time, effort and organisation (Mor & Warburton, 2014). This was, to some extent mitigated by the use of online tools to support the design activities and these processes have been successfully carried out online in other studies (Warburton, 2009). Certainly, one advantage of using face-to-face group sessions has been in moving design patterns from their alpha to beta status, by enhancing the quality of the patterns through shared scrutiny.

The work here creates a starting point for further design activity in the domain of MOOC design and development using patterns. We suggest the use of meta-design pattern or

approach based on a simple design cycle to scaffold the MOOC design process to indicate where patterns and related design principles may be deployed (Figure 2)

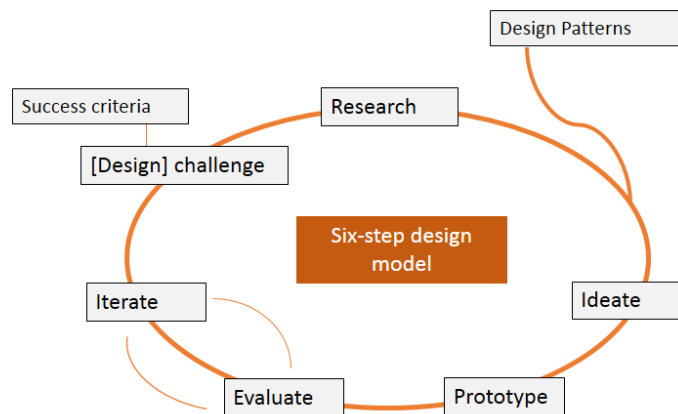


Figure 2. A six-step design model indicating an entry point for design pattern use

The project team are testing the use of these patterns in rapid design challenge workshops. Details can be found on the design patterns project site (www.moocdesign.cde.london.ac.uk).

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THE BOOT CAMP MODULE IN MASSIVE OPEN ONLINE COURSES: EXPERIENCES IN TWO EUROPEAN INITIATIVES

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Abstract

The Massive Open Online Courses (MOOCs) imply, for the educational institutions and the target public, i.e. the participants, the formulation of new goals and addressing unique challenges. In this sense, this paper intends to reach out for the meaning and importance, as a differentiator in the participants' perspective, of a familiarization module (Boot Camp Module) within a MOOC. This module intends to be an introduction to the MOOC, promoting the interaction between participants and providing information about structure and objectives of the course, as well as features of the supportive social and learning platform. Integrated in two European projects, "EMMA-European Multiple MOOC Aggregator" and "ECO-Elearning, Communication and Open-Data (ECO)", the MOOCs from the Portuguese Open University has familiarization module, a Boot Camp. The primary goal of the case study consists in the measurement of the importance of the familiarization module and the role of the facilitators' team, in the learning experience of MOOC participants, during this period of time. The messages posts in different spaces (The Wire, Blogs, Forum) were collected and analysed, resulting in an clear indication as for the importance of this module for the early setting of sense of group and a learning community. Further research should be conducted on the impact of a preliminary familiarization module on the success in context of MOOCs.

Introduction

Massive Open Online Courses (MOOCs) are a relative recent online learning phenomenon. Nevertheless, as Sir John Daniel (2012) describes "MOOCs are already bifurcated into two types of course, which are known as cMOOCs and x MOOCs". George Siemens (2012) which is engaged with cMOOCs since 2008, summarizes the differences as follows:

Our MOOC model emphasizes creation, creativity, autonomy, and social networked learning. The Coursera model emphasizes a more traditional learning approach through video presentations and short quizzes and testing. Put another way, cMOOCs focus on knowledge creation and generation whereas xMOOCs focus on knowledge duplication.

In this paper we focus on the importance of a preliminary familiarization module (“Boot Camp”) in a MOOC which has specific characteristics. The MOOC was designed in conformity with a virtual pedagogical model and using a platform resulting from the integration of a Learning Management System (LMS) and a social networking system, giving the opportunity to acquire, develop and/or consolidate 21st century skills such as collaboration, knowledge sharing and critical thinking.

Contextualization: Project EMMA and project ECO

In recent years, the European Commission increased efforts in Open Education, Open Educational Resources (OERs) and Information, and Communication Technologies (ICT) in Education in Europe. The gateway of the European Innovative Learning offers access to institutions, resources, courses and MOOCs.

European project “European Multiple MOOC Aggregator”

The European project EMMA – European Multiple MOOC Aggregator (europeanmoocs.eu), is a 30 month pilot action that will offer open, massive, online courses in multiple languages from different European providers “to help preserve Europe’s rich cultural, educational and linguistic heritage and to promote cross-cultural and multi-lingual learning”. The main goal is to work as a central aggregator and host system of all the courses produced by the partners but also as system that enables learners to construct their own learning paths using units from MOOCs as building blocks. Once operational, EMMA will be open for other providers who wish to make their MOOCs available in multiple languages and across borders. With a total of 16 MOOCs the first pilots will involve at least 60,000 participants.

European project “Elearning, Communication and Open-Data”

The European founded project *Elearning*, Communication and Open-data: Massive Mobile, Ubiquitous and Open Learning (ECO, <http://ecolearning.eu/our-project>) aims, on the one hand, to broaden the education and, on the other, to improve the cost-effectiveness - of teaching and learning by designing and implementing MOOCs as a way to use OERs. Furthermore, it intends to expand successful experiences with MOOCs in Europe into a pan-European scale, contributing to the awareness of the advantages of open education in Europe.

Brouns et al. (2014), member of a research team within the ECO, argue that the models as the xMOOCs “are proving to be inconsistent with the European standards for formal higher education due to their low-level of learner support and lack of an enriched pedagogical approach.” They adopted the following MOOC definition:

it is an online course designed for large number of participants that can be accessed by almost anyone anywhere, as long as they have an internet connection, is open to everyone without entry qualifications and offers a full/complete course experience online for free.

The “s” of sMOOC highlights the social component of the ECO MOOC Model. Learning experiences are determined through social interactions and active participation in contextualized and situated, learner-centred, settings. The MOOCs’ participants have access to the courses, regardless the learning platforms use by neither the institutions, nor the device (notebook, tablet, smartphone) used. The sMOOC is a subsidiary type of an iMOOC which was developed and implemented by the Portuguese Open University (Universidade Aberta, UAb).

The study of the Boot Camp

This article focuses on the first week of the one of the MOOCs piloted in the projects. About four hundred (410) participants were enrolled in this course. The main goal for the first week (Boot Camp) was to explore and master the features of the social platform Elgg, aiming to create a sense of community which can be also seen as a learning community or a community of practice.

The Detailed Guidelines to the Boot Camp provided the details related to the first week of the course.

During the first week, familiarization module, the participants were expected to accomplish small tasks such as:

- Update the profile with a micro-bio and a photo/avatar;
- Define how to receive notifications;
- Use the feature Bookmarks for saving and sharing hyperlinks of interest;
- Publish the first post on the blog and comment on the posts published by the other participants;
- Publish several short messages on The Wire and answer some of the other participants’ messages; and
- Use a tag.

During the first week, the discussion forum offered space to ask questions and receive answers about the course and the week tasks.

A small team of volunteers collaborated with the content experts and designer of the course. The role of the team comprised the smoothness start of the course, acting in the first week as facilitators and community coach, monitoring the social aspects, providing answers for technical issues, setting and announcing polls, peer assessment activities, and supporting the teachers’ feedbacks on the thematic.

The detailed information relative to the structure of the course (program, objectives, resources, etc.) was provided in the learning management system MOODLE, in the Learning Guide of the course – it provided the information as for the learning objectives, competencies to be developed, learning environment, methodology, resources, certification and schedule.

The social networking system Elgg (<http://eco.imooc.uab.pt/elgg>) supported the social interactions and acted as a collaborative space for the participants of the course. An articulated platform (Moodle and Elgg) from the UAb was integrated in the MOOC Platform.

The (open source) social networking system Elgg offers features/tools such as microblogging (called “the wire” and similar to Twitter), blogs, bookmarks, files upload/repository, online profile and management of “Friend of a Friend” (following of other participants creating list of “friends”). The Wire allows posting short messages, up to 140 characters (similar to Twitter) and, in context of this course, was a space created for the promotion of interaction, sharing of resources, launching challenges, or sharing a brief idea. Also the use of tag with keywords is supported.

Methodology

The study relied on collecting quantitative and qualitative data evidencing on the participation during the Boot Camp week. Data on the use of The Wire, Blogs, Bookmarks and Files during the Boot Camp week was collected and analysed.

During the Boot Camp data was collected, especially regarding the interaction, represented through the posts and comments made by the peers and the members of the facilitator team. In this sense, it was possible to compare the number of interventions using The Wire and in Blogs made in the learning community during this first week of the course.

These interventions were gathered and classified using an adaptation of the Community Indicators Framework (CIF) created by Galley, Conole and Alevizou (2014). In their words:

“The CIF is built around four key aspects of community experience: participation – the ways in which individuals engage in activity; cohesion – the ties between individuals and the community as a whole; identity – how individuals perceive the community and their place within it; and creative capability – the ability of the community to create shared artefacts, and shared knowledge and understanding.”

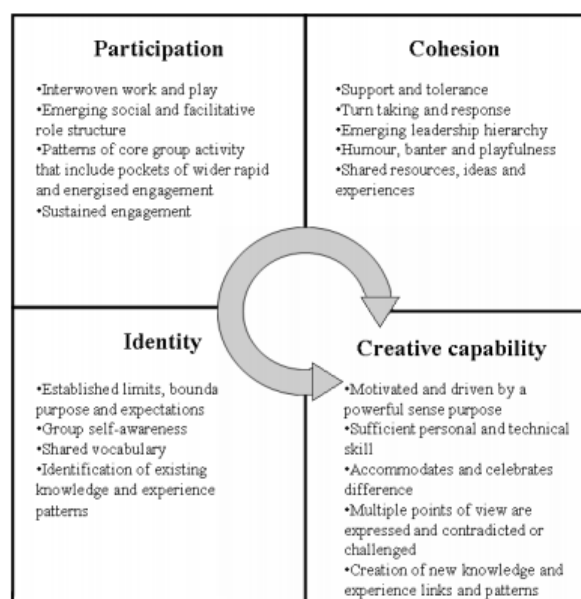


Figure 1. Community Indicators Framework (CIF) by Galley, Conole and Alevizou

Results and discussion

During the Boot Camp there were 143 messages posted in The Wire, 40 (28%) of them were from the facilitator team. Figure 2 shows the total number of messages and the facilitators' messages posted in The Wire. It can be seen that in the familiarization module every day the participants had statements/comments/feedback by the facilitator team.

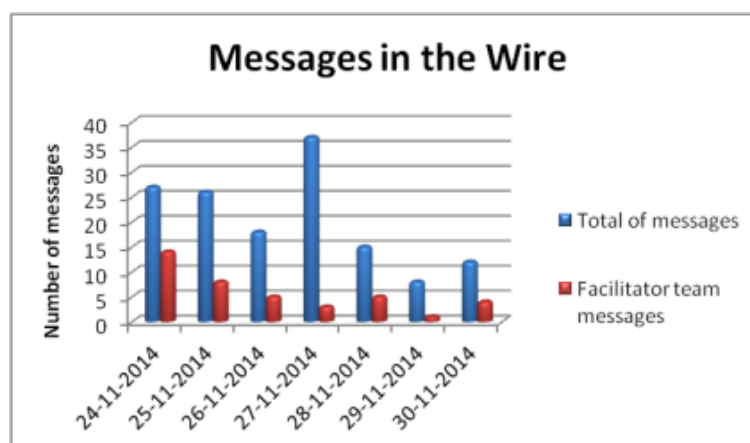


Figure 2. Messages posted in The Wire during the Boot Camp week

It seems that there was an intense interaction proven by the number of “likes” given to the messages published in The Wire or as reaction to Blog posts. One can observe that the participants interacted more in The Wire space (shorter and informal) than in the Blogs (Figure 3). However, most of the messages posted in Blogs (84%) had at least one like.

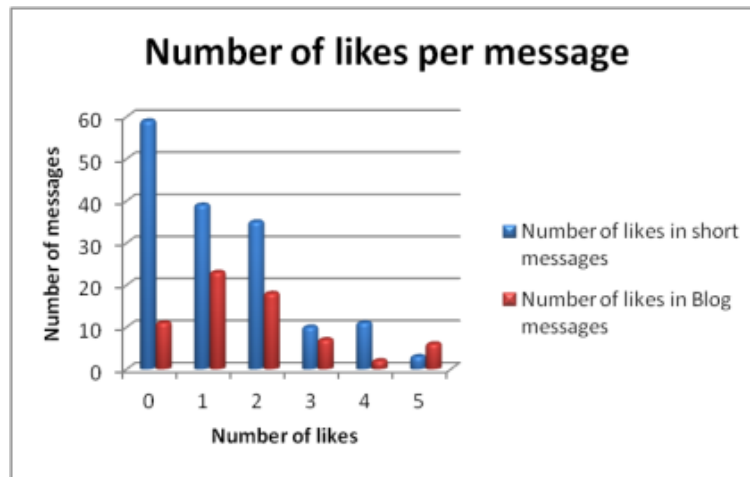


Figure 3. Likes given in The Wire and Blogs in Boot Camp week

Considering the messages posted in the Blogs, the number of interactions (comments to the initial post) registered varies between zero and eight Figure 4, and the majority of posts (48%) did not get any other kind of feedback to their Blog publications, apart from the high number of likes.

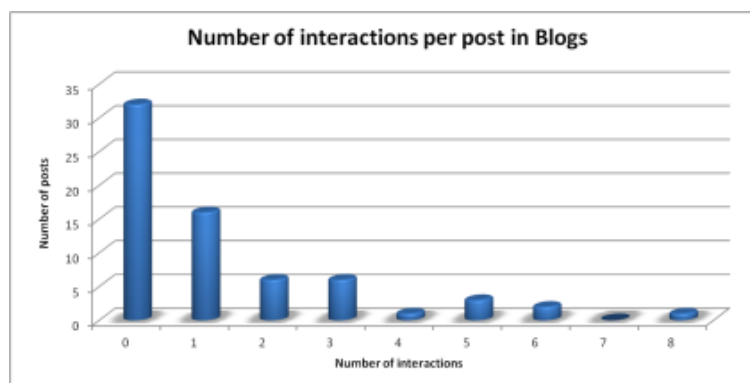


Figure 4. Interaction (peer comments) in the Blogs during the Boot Camp week

With this analysis, it is possible to visualize the global number of posts published in Blogs, per day, during the Boot Camp and establish a comparison between the answers given to the publications and how many of the answers were given by the facilitator team. It is interesting to note that during the weekend the interaction is less than in week days.

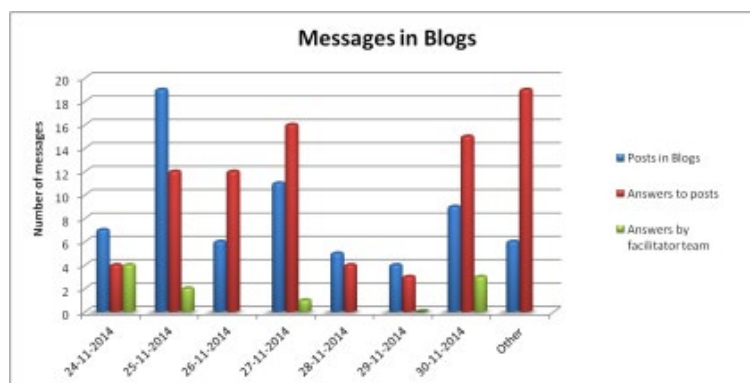


Figure 5. Interaction within the Blogs during the Boot Camp week

Finally, it was possible to relate the number of participants that interacted in short messages (56 participants) and Blog messages (58 participants) and realize that only 35 have participated in both.

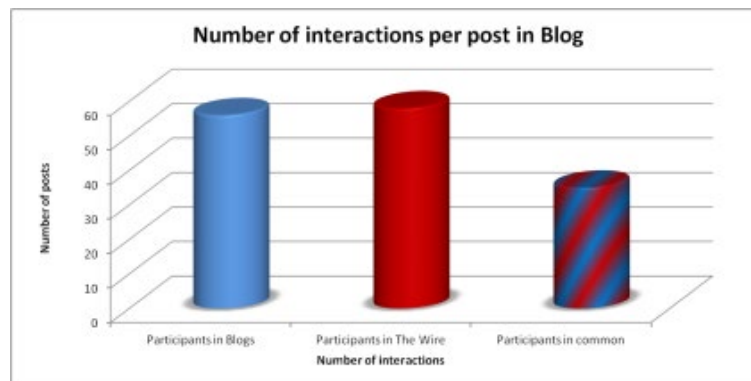


Figure 6. Interaction within The Wire and Blogs during the Boot Camp week

Based on framework for observing and supporting community activity created by Galley, Conole and Alevizou (2014), we analysed more deeply the content all the messages published in The Wire, Blog and Forum during the first week of the course. The results are presented in Table 1. As the main goal of this week was to promote the familiarization with the platform and the course architecture, we added the technical support as an extra Indicator within the Participation Category.

Table 1: Messages posted in The Wire, Blog and Forum, during the Boot Camp week

Categories	Indicators	The Wire		Blog		Forum	
Participation	Interwoven work and socialization	0	111	1	109	0	53
	Emerging social role structure	75		36		35	
	Interaction (replies)	32		72		18	
	Sustained engagement	0		0		0	
	Technological support	4		2		0	
Identity	Building of group identity	18	21	8	9	0	0
	Building of a shared vocabulary	3				0	
Cohesion	Establishing statement of support and tolerance	3	31	2	36	0	0
	Humour, banter and playfulness	1		1		0	
	Sharing resources, ideas and experiences	27		33		0	
Creative capacity	Knowledge Building (Collaboration)	3	3	5	5	0	0

It can be seen in Table 1 that the participation in *Blogs* was higher than in *The Wire*, but in *The Wire* the messages where more focus in emerging social role structure. In the Blogs we can see more interaction and interwoven work and socialization, as expected considering the nature of the Blog. The forum was used by the participants to do their presentations and it was because of that all the messages were inside the category of participation. The Identity, was especially created in the interventions in *The Wire* as expected. It is possible to see that the

number of messages asking for *Technical support* was residual and leads to the conclusion that the participants didn't have lots of difficulties with the familiarization process. It is important to point out that the creative capacity and the cohesion that was shown means that the Boot Camp went beyond the initial expectations because participants during this period had shared resources that they considered interesting and meaningful for the course and promoted the creation of knowledge building.

Conclusions and further research

In the words of Anderson (2008), "The greatest affordance of the Web for educational use is the profound and multifaceted increase in communication and interaction capability".

The integration of a social media system (Elgg) with a learning management system (Moodle) seems to be a suitable environment to offer MOOCs. The use of these integrated systems enables the familiarization module used in this iMOOC, with a strong interaction element, which proved to be an essential component in participants' learning success (Teixeira & Mota, 2015). In future work it is worth investigating the impact of the Familiarization Module in the success of a MOOC by adding an initial questionnaire and interviewing a representative number of participants.

According to Teixeira and Mota (2014), it can be argued that the iMOOC Pedagogical Model allows to bridge the gap between non-formal and formal education. For this to happen, it is necessary to create the opportunity for everyone, whatever their digital literacy level is, to archive the minimum digital pre-requirements and that one of the aims of the familiarization module.

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MOOCS AND OPEN EDUCATION IN CANADA 2015

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Abstract

Canada has important areas of expertise in MOOCs and open education, which are beginning to be built upon or replicated more broadly in all education and training sectors. This paper provides an overview of the state of the art in MOOC delivery and open higher education in Canada, providing insights into what is happening nationally and in the different provinces. There are growing examples of MOOC delivery from several Canadian institutions offering free courses to Canadians and international learners.

Introduction

Despite a growing body of literature and public opinion supporting the economic, social and political benefits of open education including MOOCs, there is a growing need for policies at government and institutional levels to become actively engaged (D'Antoni et al., 2012; Dhanarajan & Abeywardena, 2013; European Parliament, 2014; van der Vaart, 2013). The concept of open education includes provision of activities for educators, programs to support not only the development of MOOCs, but also the distribution of open education resources and textbooks and for research and development initiatives to ensure effective practices. This paper consists of a pan Canadian overview of government and key institution practices designed to support MOOC initiatives and enhance openness in many areas in postsecondary education. This overview provides a mapping of significant initiatives with the aim of sharing and promoting more vigorous policies designed to maximize MOOC development using open education practices in Canada.

Background

Canada has important areas of expertise in open education, mostly on the tertiary level, which are beginning to be built upon or replicated more broadly in all education and training sectors. There is no federal government strategy specifically supporting open educational practices at present, but there is activity at the provincial level in Western Canada. Other than the western Canadian initiatives on open practices, there are not yet any governmental policies to support them. With only the western Canadian exception, there are few other signs of any significant initiatives designed to support MOOC development and open practice-related activity across Canadian governments or industry. MOOC development and open initiatives in Canada tend to focus at the level of individual institutions and concentrate on

access and availability issues as opposed to development of practice and policy and/or initiatives to encourage openness.

Canada is unique in the world, in that it is the only country whose national government has no authority in education, which in Canada is exclusively a provincial responsibility. The federal government can however intervene in other areas relevant to open education. For example, there is a federal program underway to promote the growth of the open data movement¹ through the introduction to businesses and citizens of an open data pilot project².

The British Columbia government has also undertaken open government initiatives that provide public access to government information and data, giving citizens opportunities to collaborate on matters such as policy and service delivery. Its open government licence enables use and reuse of government information and data.

Canadian universities are becoming familiar and comfortable with the concept of open access and are actively sharing scholarly research and data through university repositories; providing author funding to assist researchers with open access fees; or working to minimize or avoid open access fees levied by publishers. This includes support for open university presses such as Athabasca University Press (AUPress)³ and limited open titles from the University of Ottawa Press⁴ and other university presses. There is also participation in the promotion of Canadian Creative Commons licences⁵. While openness along with and supported by the MOOC phenomenon can be seen as a growing trend, specific or detailed Canadian open education initiatives, in many sectors, are difficult to isolate. Few Canadian institutions are visibly working on open education and/or policy development.

The concept and activities of openness are clearly evident in the many Canadian universities and community colleges developing programs and policies to broaden open access and designing, developing and building learning object repositories (e. g., Athabasca University, Memorial University, Concordia University, University of Calgary, etc.). Of these, Athabasca University – sometimes referred to as Canada’s “First OER University”⁶ – was the first Canadian institution to adopt an open access policy⁷ in 2006, revised in 2014, which recommends that faculty, academic and professional staff deposit an electronic copy of any published research articles (as elsewhere accepted for publication) in an AU repository. In 2009, The University of Ottawa adopted “a comprehensive open access program that supports free and unrestricted access to scholarly research”⁸. Some of the initiatives in its open access program include a promise to make accessible for free, through an online repository, all its scholarly publications; an author fund designed to minimize open access fees charged by

¹ http://en.wikipedia.org/wiki/Open_data_in_Canada

² <http://open.canada.ca/en/?lang=En&n=F9B7A1E3-1>

³ <http://www.aupress.ca/>

⁴ <http://www.press.uottawa.ca/>

⁵ <http://www.creativecommons.ca/>

⁶ http://wikieducator.org/Athabasca_University/Meet_Athabasca_U_-_Canada's_First_OER_university

⁷ <http://ous.athabascau.ca/policy/research/openaccess.htm>

⁸ <http://scholarlycommunication.uottawa.ca/>

publishers; funding for the creation of digital educational materials accessible by all online, for free; and commitment to publish a collection of open access books and research funds to continue studies on open access.

Other universities are following suit. University of Toronto/OISE, for instance, adopted a formal policy⁹ on open access in March 2012, referencing the Open Data pilot (Government of Canada initiative). Nonetheless, while the concepts of openness and open access appear to be gaining considerable ground, and in spite of the apparent endorsement by government, their growth – similar to that of OER – is threatened by lack of public funding.

While openness can be seen as a growing trend, specific or detailed Canadian OER initiatives, in many sectors, are difficult to isolate. Few Canadian institutions are visibly working on open practices and/or policy development. Nevertheless, the western region of Canada does have real projects and initiatives in progress and is engaged assembling, developing and using OER.

MOOCs

MOOCs (Massive Open Online Courses) grew out of the open education movement. Yuan and Powell (2013) describe how MOOCs developed out of the open education, open source, open access, open educational resource movements. Although there are commercial versions of MOOCs now in operation such as Udacity and Coursera, their origins can be tracked back to earlier open initiatives. Weller (2014) noted that MOOCs didn't appear overnight from nowhere claiming that MOOCs (at least the non-commercial ones) "can be seen as part of a continuum", positing MOOCs as the clearest case for the argument that openness has been successful.

First in Canada

MOOCs have a Canadian origin. The name dates to an experimental course led by George Siemens at the University of Manitoba and Stephen Downes at the National Research Council in 2008 (Tamburri, 2014). They taught an online university certificate credit course, *Connectivism and connective knowledge* (Downes & Siemens, 2008) with 25 students; and more than 2,200 additional learners joined the course online. As Siemens reports, this course, delivered in 2008, was the first MOOC, combining open content with open teaching. This concept was developed from the idea of an open Wiki pioneered by David Wiley at Utah State University and an open session on social media in which international guest experts led discussions, implemented by Alex Couros at the University of Regina (Siemens, 2012).

"The MOOC is open and invitational" (McAuley et al., 2010), anyone can participate and each learner determines for him/herself the extent of their participation. This decision may be based on personal interest, workplace requirements, academic goals or for other reasons. This openness allows many people to participate who may otherwise be unable to access learning.

⁹ http://www.oise.utoronto.ca/research/UserFiles/File/OA_Policy.pdf

In 2011, Sebastien Thrun at Stanford University delivered a MOOC on Artificial Intelligence to more than 100,000 learners. But, this MOOC was more teacher and content-centric than the original connectivist MOOC. This and later primarily US-based MOOCs are exporting the “sage on the stage” lecturing model of classroom learning to the online world.

cMOOCs and xMOOCs

Downes coined the term cMOOC to describe their course — the “c” stands for “connectivist.” He called the new instructivist courses xMOOCs (Downes, 2013). Whereas cMOOCs had the goal of using the Internet to create an extended network of learners who generate content and learn from one another. David Cormier at the University of Prince Edward Island is continuing this tradition with a pre-university preparatory course as a MOOC – *ExperienceU* or *XPU*.

The xMOOCs have become the predominant form of MOOC delivery in Canada, with more than 30 MOOCs being offered by Canadian institutions or individuals presently. Most of them are provided by top-tier traditional institutions using the commercial Coursera platform (McMaster University, University of British Columbia, University of Toronto); or the non-profit EdX platform (McGill University, University of Alberta, University of British Columbia, University of Toronto). Others, mainly middle-tier institutions use the openly licensed CanvasNet platform (Dalhousie University, Royal Roads University, University of Saskatchewan). There are also several self-published Canadian MOOCs¹⁰.

The majority of Canadian MOOC deliverers are aligned with the for-profit US company Coursera, with some others aligned with the not-for-profit EdX group led by the Massachusetts Institute of Technology and Harvard. Udemy is a for-profit company that hosts a platform for independent instructors, who run their own MOOCs, so far there is only one delivered from Canada. Wide World Ed is a Canadian grass roots organization that has tried to implement some home-grown Canadian MOOCs “for the public good” with limited success.

OER Universitas

OER Universitas (OERu) while not using the term “MOOC” (preferring short “micro” courses), is offering free online university courses in collaboration with Canadian partners so that learners can gain formal credentials from the partner institutions. OERu is a consortium of more than 30 institutions and several organizations on five continents. It is dedicated to widening access and reducing the cost of post-secondary education for learners internationally by providing OER pathways to achieve formal credible credentials (McGreal, Mackintosh & Taylor, 2013). There are seven members of the OERu in Canada: three universities (Athabasca, Thompson Rivers and Kwantlen); one community college (Portage College in Alberta); and three organizations (BCcampus, eCampus Alberta and Contact North in Ontario).

¹⁰ <https://www.mooc-list.com/countrys/canada>

Commonwealth of Learning

Based in Vancouver, British Columbia, the Commonwealth of Learning (COL) is charged with promoting open education throughout the 53 countries of the Commonwealth. In 2013, in collaboration with the Indian Institute of Technology, Kanpur (IITK)¹¹, they delivered a MOOC on *Mobiles for development* to more than 2,000 learners from 116 countries including many non-Commonwealth countries (e.g. in eastern Europe. They used a modified model of the cMOOC on an open source platform (Sakai), developing appropriate OER as YouTube videos (Reporter, 2014).

Athabasca University

Athabasca University delivered a cMOOC in 2013 on Open Education. It could be described as an “embedded” MOOC (not to be confused with a MOOC on *Embedded Systems* as a subject¹²) because it was based on and delivered with a for-credit Master of Education course at the Centre for Distance Education (Davis, 2014). The MOOC learners followed the same course materials, but they were separated from the enrolled students and it proved unsuccessful as synergies between the two groups suffered from the separation. This illustrates a common challenge, in that the students (and teachers) who enrol in regular online courses expect to participate in teacher/student interactions, and often collaborative learning as well as assessment. It is hard to scale this to massive numbers of non-fee-paying students.

There is significant OER activity at Athabasca University. AU was the first university in Canada to join the Open Courseware Consortium (now the Open Education Consortium – OEC¹³), and as of 2014, was still the only Canadian institutional member. This includes the OEC website¹⁴. The province of Alberta and AU have been chosen to host the 2015 OEC Conference. AU was also given an OEC ACE Award in 2014 for its highly visible OER research website, the OER Knowledge Cloud¹⁵. AU has also made available courses and course modules including multimedia objects at the AU OEC site licensed for use, generally with a Creative Commons Attribution licence.

AU is home to the Technology Enhanced Knowledge Research Institute (TEKRI)¹⁶, and (as mentioned previously) the UNESCO/COL/ICDE Chair in OER¹⁷, which promote research into and the use of OER at the institutional, national and international levels. The OER Knowledge Cloud was created as a goal of the Chair initiative. The Chair is a member of the board of the OER Foundation¹⁸, which hosts the OER universitas (OERu). AU’s open access started with the scholarly journal, International Review of Research in Open and Distance

¹¹ <http://www.iitk.ac.in/>

¹² <http://austinblackstoneengineering.com/ut-6-01x-the-first-embedded-systems-mooc-with-hardware-requirement/>

¹³ <http://www.ocwconsortium.org/>

¹⁴ <http://ocw.lms.athabascau.ca/>

¹⁵ <http://oerknowledgecloud.org/>

¹⁶ <https://tekri.athabascau.ca/>

¹⁷ <http://unescochair.athabascau.ca/>

¹⁸ <http://wikieducator.org/OERF:Home>

Learning (IRRODL)¹⁹ in 1999 and in 2005, with the implementation of AUSpace²⁰, a DSpace repository of scholarly articles, theses, and other documents produced in the AU community. In addition, AUPress at AU was the first open access university press in Canada in 2010 and currently offers over 100 volumes. Other AU open initiatives include participation in workshops and conferences, conducting a mapping of open educational activities with POERUP²¹ and eMundus Europrojects²², and supporting GO-GN²³, the Global OER Graduate Network.

University of Alberta

The University of Alberta delivered Canada's first xMOOC, *Dino 101: Dinosaur Paleobiology* (University of Alberta, 2013) and this too might also be considered a type of embedded MOOC as there were three options, a free non credit learning experience, registration in Coursera's signature track (\$69), or a paid for-credit course (\$263) with two invigilated examinations. The first iteration of the course attracted 17,000 students with a relatively high completion rate of 17% with 77% engaging in at least one course activity (Onlea, n.d.). This course also led to spin off company OnLea which hopes to sustain a commercial business by creating MOOCs for institutional and commercial clients.

BCcampus

BCcampus, arguably the most active collaborative Canadian organization in the open practices arena, is a publicly funded service which has turned to open concepts and methods to create a sustainable approach to online learning for BC public post-secondary institutions. BCcampus was created to enhance students' ability to not only identify, choose, register for, and take courses but also to apply any academic credits earned against credentials from a selected home institution; it was also intended to benefit institutions through the rationalisation of demand for academic opportunities from students with the supply of online courses from BC public post-secondary institutions.

It has been the leader in Canada in promoting OER. BCcampus also played a major role in the BC Ministry of Advanced Education, Innovation and Technology's decision to support the Open Textbook Project²⁴, which they are implementing. BCcampus hosted a working forum on OER²⁵ for senior post-secondary institution representatives in Vancouver in October, 2012 with the objective of developing a common understanding of what OER could mean for BC and building a shared vision of how to develop and use them. The session also studied ways BC can take advantage of the promise of OER and specifically, open textbooks. This led to the announcement by the MAE that they will collaborate with post-secondary institutions in implementing open textbooks. As mentioned above (see BC government) the Project started

¹⁹ <http://www.irrodl.org/>

²⁰ <http://auspace.athabascau.ca/>

²¹ <http://www.poerup.org/>

²² <http://wikieducator.org/Emundus/Home>

²³ <http://oer-unescochair-ounl.ning.com/go-gn>

²⁴ <http://bccampus.ca/open-textbook-project/>

²⁵ <http://open.bccampus.ca/2012/09/23/open-educational-resources-oer-forum-in-vancouver-october-18th/>

with 40 open textbooks at the postsecondary level and now is committed to 90 (BCcampus, 2014).

University of British Columbia (UBC)

UBC partnered with Coursera to produce and trial five pilot MOOC courses in 2013. As is common of the 330,150 people who registered for the courses only 164,935 actually logged and 8,174 completed the courses (2.5% of registrants or 4.9% of those who enrolled). The University lists production costs for the mostly video MOOCs at \$54,000 per MOOC, excluding faculty time and co-ordination support, but including academic assistance. These numbers exclude cost for faculty development and administration and the time requirements for negotiations with Coursera (University of British Columbia, 2014).

Thompson Rivers University Open Learning (TRU)

TRU houses the former BC Open University as its distance education wing, called TRU Open Learning²⁶. It is working with several OERu partner institutions providing initial prototype courses²⁷ to be released as OER. TRU Open Learning, like AU, has a robust PLAR system²⁸ that includes challenge examinations and transfer of credit, which makes it a key partner for OER initiatives nationally and internationally.

OCAD U Inclusive Design Research Centre (IDRC)

IDRC, a research and development centre²⁹ at OCAD U in Ontario, consists of an international community of open practice advocates. The learning technologies and products that have been developed and distributed by IDRC are distributed under the GNU General Public License³⁰ meaning that the code is open source and requires users to share products on the same liberal licensing that they have acquired it.

A key project, FLOE³¹ (Flexible Learning for Open Education) is one of the Centre's biggest initiatives. FLOE takes advantage of the fact they have a set of curricula that is openly licensed that can be repurposed and reused to make content accessible. This makes FLOE heavily dependent on OER. OER present an optimal learning environment to meet the needs of all learners, including those with disabilities. FLOE advances the strengths and values of open education and encourages pedagogical and technical innovation. FLOE also promotes OER for their content portability, ease of updating, internationalization and localization, content reuse and repurposing, and more efficient and effective content discovery. FLOE's work is international and broad: to support adoption in Africa and other areas where mobile devices are more prevalent than internet access, FLOE creates tools and services for delivery as OER via audio, text messages and the small screens found on popular cell phones. These same tools and services are intended to support accessibility, through inclusive design.

²⁶ <http://www.tru.ca/distance.html>

²⁷ http://wikieducator.org/OER_university/Planning/OERu_2012_Prototype

²⁸ <http://www.tru.ca/distance/plar-ol.html>

²⁹ <http://idrc.ocad.ca/index.php/about-the-idrc>

³⁰ <http://www.gnu.org/licenses/gpl.html>

³¹ <http://floeproject.org/>

Contact North/Contact Nord (CN/CN)

CN/CN³² is Ontario's distance education and training network. It works to provide programming from public college, universities and schools with a focus in smaller towns, rural and remote communities. Contact North published a major position paper on OER, Open Educational Resources (OER) Opportunities for Ontario³³ which "set(s) out the case for the implementation of an Ontario OER initiative (Contact North, 2011); it has also published an introduction to MOOCs and promotes their implementation in the province

Université de Montréal (UdeM)

Hautes Études Commerciales (HEC) at UdeM has been offering a series of MOOCs since 2012. These course are offered in French and about 60% of the students are from Francophone countries outside of Canada. The MOOC courses were developed on the Sakai platform and supported by the University without collaboration with any commercial MOOC providers. The courses were also used to support research on the relationship between motivation, behavioural engagement and persistence for MOOC participants. A final logistic regression model correctly predicted persistence for 90% of MOOC participants based on early MOOC behaviour (Pollhuber, Roy & Anderson, submitted paper)

Téléuniversité du Québec (TÉLUQ)

TÉLUQ³⁴ has a policy on the dissemination of educational resources – Politique de gestion de la diffusion des ressources d'enseignement et d'apprentissage (REA)³⁵. These policies relate to learning content in general and could include OER and MOOCs, although initially designed for proprietary content. Because TÉLUQ faculty retain the intellectual property of all original material they produce for teaching, institutional policy has limited impact on what professors do with their material outside TÉLUQ. The LICEF – Laboratoire en Informatique Cognitive et Environnements de Formation³⁶ is a research centre at TÉLUQ, which is hosting the Banques des ressources éducatives en réseau (brer)³⁷ a repository of French language OER.

Summary

Rogers (2013) identified five factors associated with adoption of innovation. Three of these are relative advantage of the innovation; visibility of adoption by others; and the capacity for potential adaptors to make trial applications of the innovation. In this paper we have documented efforts, policies and programs in the public postsecondary sector that are designed to address all three of these factors. Efforts by institutions in creating MOOCs and organizational support for open access are designed to determine and demonstrate relative advantages of open education from both pedagogical and economic perspectives. In large and

³² <http://www.contactnorth.ca/>

³³ <https://oerknowledgecloud.org/?q=content/open-educational-resources-oer-opportunities-ontario>

³⁴ <http://www.telug.ca/>

³⁵ <http://www.bdeb.qc.ca/fichiers/2013/10/polgrh-amendeca-16avril13-1.pdf>

³⁶ <http://www.licef.ca/>

³⁷ <http://www.brer.ca/>

complex countries with diverse educational institutions it is difficult to be aware of many divergent practices and policies that are emerging.

Finally, we have documented the efforts of governments and institutions to provide incentives for the development and trialling of MOOCs, open education courses, textbooks and scholarly publications. The implementation of MOOCs and open education in Canada is in its early stages. However, with the growing interest in MOOCs, and recent OER initiatives, it could very well be on a fast track towards a massive increase in educational accessibility using MOOCs and OER. Although there are only a few organizations in Canada currently working to develop and establish higher level government policy, standards and protocols related to open education, the process has begun and one can optimistically forecast expansion of these efforts.

The multiple affordances of the Internet create opportunities for both disruptive and incremental change to the way in which both formal and informal learning are designed, organized and delivered. In particular, the ability to both deliver and replicate educational content at cost approaching zero creates tremendous opportunity but at the same time challenges current means of educational provision. In this paper, we have overviewed Canadian responses to these opportunities focussing on OERs and MOOCs. It is clear that many pilot projects and programs are in progress, but equally clear that change is slow and piece meal.

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A PEER-MENTORING APPROACH FOR THE CONTINUOUS PROFESSIONAL DEVELOPMENT OF EDUCATORS IN A MOOC SETTING

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Introduction

The Massive Open Online Course (MOOC) called 'Learning Design Studio for ICT-based learning activities' was offered from May 19th to June 20th 2014 to teachers and teacher trainers as part of the second pilot of the European Lifelong Learning project HANDSON. The MOOC was aimed at promoting the inclusion of Information and Communication Technologies (ICT) in teaching and learning by empowering educators with digital competences. Following the Learning Design Studio approach (Mor & Mogilevsky, 2013), the MOOC was designed as a set of activities to walk educators in the design process of an ICT-based learning activity ready to be used in their classrooms.

The data presented in this paper explains how peer-mentoring was implemented for this second pilot of the HANDSON project and how it worked. Both the quantitative and qualitative data gathered show that feedback and comments from peers were positively valued. Also, the data show how peer mentoring generated a shift from the facilitators being at the centre of the conversations to the participants being the leaders of conversations.

Approaches to peer mentoring

Although 'peer mentoring' seems to be the winning term in the current literature, some authors use 'peer assessment' or 'peer grading' for similar purposes. In principle, peer mentoring does not involve evaluation necessarily, and this would be the main difference with peer assessment.

Topping (2005) defines peer mentoring as "the acquisition of knowledge and skill through active helping and supporting among[st] status equals or matched companions". There is an essential contrast with classic mentoring, also recognized as 'e-mentoring' where the interaction is expert-novice. Akin and Hilbun (2007), found the "definition of e-mentoring" to be the following: the merger of mentoring with electronic communications to develop and sustain mentoring relationships linking a senior individual (mentor) and a lesser skilled or experienced individual (protégé) independent of geography or scheduling conflicts. In peer

mentoring the levels of the two participants in the interaction are similar, as it would happen with students in a classroom or virtual learning environment. Peer assessment is also defined by Topping (2005) “as an arrangement in which individuals consider the amount, level, value, worth, quality or success of the product or outcomes of learning of peers of similar status”. Peer assessment frameworks, methodologies and tools, though more focused on products, scores and outcomes, are mostly applicable to peer mentoring, and because of that it is also relevant to the present paper.

It is interesting to notice that peer mentoring effects go beyond the improvement of specific parts of the individual learning process. Mcloughlin et al. (2007) suggest that peer mentoring increases the sense of community by exchanging ideas and sharing experiences. Also, according to a study made by Towndrown in 2013 (Towndrow et al, 2013) engagement with the course is improved. Another important collateral factor of peer mentoring is its effect on the metacognitive processes of the individual. By evaluating others’ works and practices, students develop new criteria to improve their own learning activities (Akin & Hilbun, 2007). Some works have suggested that students should review their own evaluations after the evaluation process is finished in order to improve their skills as peer mentors (O’Toole, 2013).

In the realm of MOOCs, many of them are trying to involve peers through several strategies in order to increase students’ satisfaction. Currently, the most common way to deal with this issue is based in the use of forums, where course facilitators post messages and propose learning activities (usually with videos or Internet resources) and try to engage students to help each other. There are also other approaches to engage students with peer mentoring. An example is the “quad blogging” experience (Towndrow et al, 2013), in which students formed groups of 4 persons. Each week, one of them wrote a post about the week work, and the others commented about it and tried to involve the rest of the classmates. Other practices are based in the intensive use of social media (Purser, Towndrow & Aranguiz, 2013) where facilitators proposed students to introduce themselves in several social networks one week before the course started, creating a sense of community and getting students engaged to mentor other peers during the course.

Regarding the use of specific tools for peer mentoring, the list is quite long. Tardy and Mocozet (2013) have documented a comprehensive list of them, where wikis, blogs, ePortfolios, collaborative tools and other web 2.0 tools are proposed. More specifically, Mcloughlin et al. (2007) suggested web 2.0 tools as a way to address the needs of novice teachers and proved to be a catalyst for the development of an online community. Along with these tools, newer systems based on artificial intelligence and algorithms in general are supposed to make a difference in the near future, as recommendation systems and other intelligent components have demonstrated in other fields (Torres Diaz, Infante Moro & Valdiviezo Diaz, 2014).

The HANDSON project and its second pilot

The Hands-On ICT project (handsonict.eu) aims at facilitating the integration of ICT tools in teaching and learning by developing a learning-by-doing environment to be explored by themselves or with the guidance of a mentor. The project, following a user-centred design methodology, consists of three pilots involving educators from three sectors: Higher Education, Vocational Education and Training and Secondary Education.

The MOOC that we describe in this paper corresponds to the Pilot 2 of the HANDSON project. The main features of this MOOC were:

- An emphasis on a hands-on approach based on a design process and bringing together educators with wide and diverse backgrounds from around the world.
- A focus on the Learning Design Studio (LDS) approach to help educators design courses and learning activities.
- Facilitators with expertise in Online Learning, Creativity and the Learning Design Studio who work with participants to explore the potential of this learning method to introduce ICT in the teaching and learning processes.
- The opportunity to observe, practice and learn about methods for peer review and peer mentoring.
- The creation of practical artefacts that can be reused by the participants in their actual classrooms.

The Learning Design Studio for ICT-based Learning Activities MOOC (DS4ICTL, <http://riga.uoc.es/moodle/>) lasted 5 weeks and covered a design process starting with the educational challenge and the needs of end users, then designing, prototyping, evaluating and refining the learning activity. The course used two different environments in order to provide participants with guidance and communication tools as well as a set of pre-defined templates that facilitated the work and the comments from peers and facilitators.

Each week of the course corresponded to a concrete stage of the Learning Design Studio framework: Initiate, Investigate, Inspire and Ideate, Prototype, Evaluate and Reflect.

Moodle was used to manage the course and the ILDE (Integrated Learning Design Environment) tool was used for the development of the course activities specific to the Learning Design Studio approach. ILDE (Hernández-Leo et al., 2014) is a tool developed by the METIS project and allows organizing and supporting the learning process allowing to work with specific templates and to create the documentation required for each activity.

There were 743 participants in this course from 42 countries generating a total of 2,744 messages in the forum. There were three facilitators supported participants throughout the course.

Facilitators were responsible for the refinement of the activities, the collection and organization of the learning resources and the dynamization of the course. They also provided

personalized and group feedback, tracking students' performance as well as promoted peer mentoring throughout the MOOC.

Peer mentoring in the LDS4ICT MOOC

Peer mentoring is a key element of the HANDSON project and was chosen as a way to create communities of practice among educators and offer ongoing support in the introduction of ICT in the teaching and learning processes. The targeted learners of this MOOC were educators from different sectors and countries.

Several concrete actions and tools were set during the course to involve peers in the learning and feedback process:

1. Explicit mention in the course description and methodology about the use of peer mentoring. From the beginning of the course, we informed participants about the use we were going to make of mentoring methodology. Besides, in the description of activities we always encouraged students to publish their work and look at the other participants' contributions
2. Include specific peer mentoring activities. An important part of most MOOC activities was sharing the work in the forum to receive and also provide feedback. These are some examples:

Activity 2: Set up your Design Studio Journal

– Post your first entry in your design studio journal – what did you think about the introduction? What are your expectations for this MOOC? What are you puzzled about?

– Post a link to your design studio journal in the “Design studio journals” discussion forum, and visit other’s design studio journals and comment on their entries.

Activity 22: Do you value the feedback of your peers?

– As you have seen during all the course peer-review is a very good way of getting feedback and iterating your activity. Try to offer feedback to your peers using their own heuristics evaluation protocol.

– Go to the Moodle forum and review 2 other learning activities so that participants can improve their own. You can use their own heuristic evaluation protocol as a way of offering the feedback they need to improve their activities. You can send your comments using ILDE and the Forum

– Look at the reviews others have done to your activity and reflect your peers’ comments.

3. Comment participants contributions as part of the facilitators tasks.
 - This was done through the daily entries in the course journal, during the weekly convergence sessions and in the forums. In the “Daily journal” we mentioned participants names and activities highlighting weak and strong points that could be useful to all participants to evaluate their own activities and also others. Here again, the aim of this action was to help participants evaluate their own activity looking at the evaluation of their peers.
 - The “Convergence session” were Hangouts On Air sessions where we tried to highlight the work made by students and also provide individual feedback to the participants that joined the session.
 - Also, facilitators tried to quote always participants activities in their daily messages in the forum as a way of motivating and encouraging peer mentoring.
4. Provide appropriate interactive tools.

We provided ICT tools that allowed participants to use functionalities that promote peer mentoring such as add comments to others, sharing, editing, publishing, etc. The main tools were: Moodle forums, ILDE, Google Hangouts and the chat.

The peer mentoring during the second pilot of the HANDSON project has been analyzed using the following indicators: i) number of messages among participants in the Moodle forums, ii) number of comments in the activities developed in ILDE, iii) participants perception about peer mentoring and interaction during the MOOC. As a result, the data that follows has been gathered from the Moodle, the ILDE and the final survey that was sent to students. Besides, the qualitative comments from participants have also been taken into account.

The quantity of messages in the forums shows the considerable interaction among participants. Also as it is common in most of MOOCs the participation decreased meaningfully as the course advanced (Nawrot & Doucet, 2014). As the table shows in the 5th week there were half of the messages of the first week. The following table summarizes the participation in the forums of the course, especially those where the participants shared their activities.

Table 1: Data collected from the interaction generated in the weekly forum in MOODLE

	Discussions created	Participants	Total messages or comments	Average message/participant
1 st week forum	40	218	663	3.04
2 nd week forum	11	152	656	4.31
3 rd week forum	19	114	466	4.08
4 th week forum	8	75	377	5.02
5 th week forum	24	67	359	5.35
Total	102	626	2521	4.02

In the following table we can see the participation of the three more active users in the weekly forums. This table shows the evolution of their participation in forums, being the facilitators the most active users at the beginning, and how this trend evolves to peers becoming more active than facilitators.

Table 2: Data collected from the interaction generated in the weekly forum in MOODLE

	User 1 (messages)	User 2 (messages)	User 3 (messages)
1 st week forum	id 321 (26)	id 366 (18)	id 604 (17) facilitator
2 nd week forum	id 604 (22) facilitator	id 67 (19) facilitator	id 1033 (13)
3 rd week forum	id 959 (12)	id 1033 (12)	id 354 (11)
4 th week forum	id 1033 (30)	id 238 (17)	id 447 (16)
5 th week forum	id 776 (34)	id 1033 (28)	id 327 (12)

The ILDE environment was used for participants to develop the course activities. The following table summarizes the activity within this tool.

Table 3: Data collected from the activity generated in ILDE environment

	Users	Designs created	Comments	Average users/designs	Average users/messages
ILDE	305	1400	603	4.5	0.5

The LDS4ICT MOOC shift: From facilitators to participants

In order to analyze the data from the Moodle forums, we have used a plug-in. This Moodle plug-in gave us the data from the interactions happened in the forums, being able to know who answers to who. The plug-in creates a Json document with all the data needed to generate the graphs using a D3 script. The focus of this analysis was to see the interaction among participants and facilitators and how this evolved during the 5 weeks of the course.

The following graphs show this evolution and differentiate between the messages from participants (orange dots) and the messages from facilitators (blue dots). These graphs visually show how the facilitators played a key role during the first weeks and how as the course advanced the participants took a more central role in the communication and interaction in the forums. We conclude, then, that the peer mentoring actions were successful in promoting a sense of community, and empowerment of the role of the participants in the MOOC and a key role of peers as active learners.

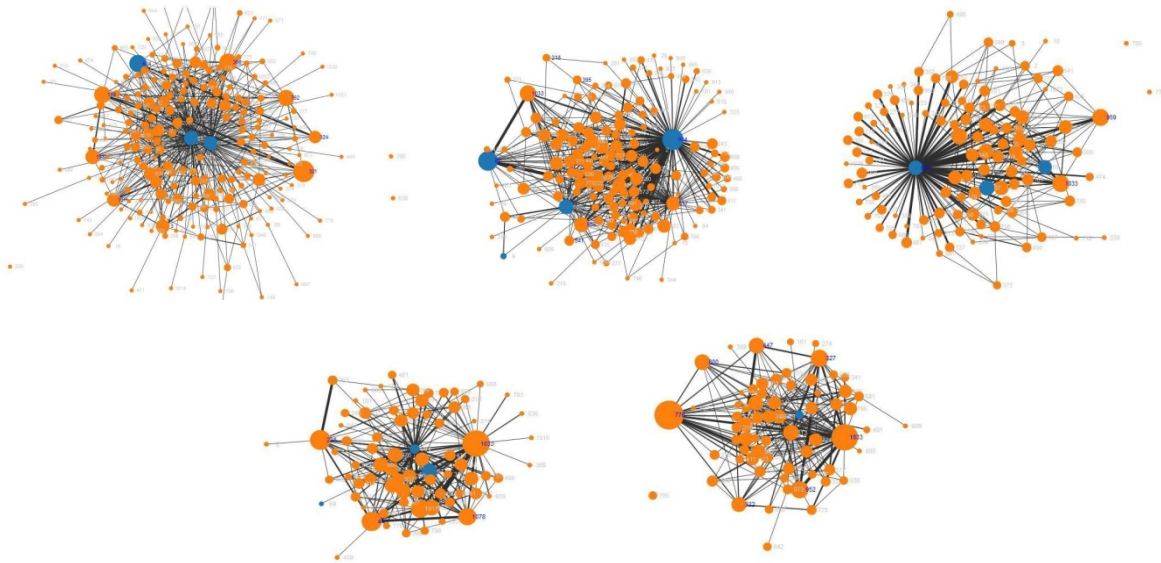


Figure 1. Interactions in the weekly forums. Ordered from week 1 to 5.

Peer mentoring and interactions, the participants perceptions

At the end of the MOOC a final survey was sent to all participants. The questionnaire included several questions regarding peer mentoring and the facilitators' role. The results regarding these questions confirm the positive opinions shown in the forum about the feedback received of their peers for their learning.

- From the 154 answers, 103 participants (53%) agree or strongly agree on the statement that “the course promoted interaction with my peers and this has been very valuable”. 20% of participants selected “indifferent” to the statement.
- 153 participants responded the question “The feedback I received from peers was useful to understand my performance in the learning activities”. 84 participants (50.2%) agree or strongly agree with this questions. 23.56% of participants selected “indifferent” to the statement.
- To the question “Peer mentoring is a good way to get feedback and enhance my learning”. 146 participants answer this question being 97 (49%) agree or strongly agree with the statement. 28 (14.1%) selected “indifferent” to this item.
- To the question “I did not enjoy reviewing and commenting on my peers' contributors”. 146 answer this question. 73 participants (36.8%) disagree or strongly disagree. 38 participants (19.1%) are indifferent for this item. 35 participants (17.6%) agree or strongly agree.

Here we highlight some of the comments collected:

“I was very excited to participate in this online learning course and I was so looking forward to seeing what the other participants share and comment so I can amplify my knowledge and perception. I was also happy to share my

experiences with everybody and hoped for interesting and educational five weeks together.”

“Through this whole journey I learnt something: It is very important to share thoughts and learn from the colleagues: I believe that if we let our students interact with each other- instead of face to face teaching-learning outcomes will be greater.”

“I’m truly humbled by your kind words and insightful feedback! :) Thanks for taking the time to browse through my narratable on “Martin” and the padlet, too.”

In sum, both the qualitative and quantitative feedback gathered during the course regarding the peer mentoring element was very positive and encouraging. However, more specific actions and activities need to be implemented in order to take full advantage of it. Despite all the positive feedback regarding peer mentoring, most participants’ comments were encouragements without providing ways of improving the work.

Discussion and further work

The implementation of peer mentoring actions and strategies during the second pilot of the HANDSON project were successful in raising awareness of the value of feedback from peers and in the engagement of participants as active learners during the MOOC. However, more work needs to be done to make the contributions of peers enriching for the learning processes of participants and to maintain the community alive after the end of the MOOC.

Participants asked for clear indications and guidance regarding the activities of the MOOC. This was mostly provided for the individual activities but a framework also needs to be provided regarding the peer mentoring. Several works have suggested the need to develop clear guidelines that explain students how to perform peer mentoring, such as Mcloughlin et al. (2007). Cooper and Sahami (2013) point out that, some learners in peer assessment grade without reading the work to be reviewed or do not follow a clear grading scheme, which negatively impacts the quality of the given feedback.

Roles of students are especially important to be defined, as stated by Level and Mach (2005) and Tardy and Mocozet (2013), which remarks the importance on how peer mentoring is introduced to students. As suggested by Guardia et al. (2013) building trust on self and peer assessment can be addressed by elaborating objective and precise criteria and explanation. The design of rubrics, scales, and explanatory automatic answers are supportive tools for the learner. Furthermore, provide clues on how to collect learning evidence and organize them to provide accountability of learning trajectories.

The experience with the HANDSON MOOC also points towards this direction. A clear framework needs to be provided to participants if we want peer mentoring to be truly useful for the learning processes.

Along with the need to be more clear with the process about peer mentoring, as MOOC designers, we faced other difficulties already existing in the MOOC literature: how to guarantee that students are skilled enough to validate the work of peers? As suggested by some experts, many students do not rely on their peers' comments. O'Toole (2013) says that as the need for interpretation grows, the necessary level of understanding required of the student assessor also grows. As we move up degrees of sophistication, from simple knowledge testing to assessing competencies in applying knowledge in complex situations, and up to the creation of new knowledge, the problem only gets worse. Group assessment, considering groups as the 'peer evaluators' could be a way to improve the quality of the assessment. Other strategies suggested by the same authors are creating ePortfolios in order to collect students' performance as peer evaluators and even providing badges for that. Similarly, CPR (Calibrated Peer Review), a system for coordinating and evaluating peer reviews of students work (Suen, Russell & Schimpf, 2013) is suggested as a way to select a group of peer mentors that are well qualified to evaluate. The method consists of comparing the scores given by students to those given by teachers/facilitators to the same exam or test. Students who give a score similar to those of teachers could be considered as fair evaluators.

To promote peer mentoring by using challenges as earning badges or recognition in the course, is, in our opinion, a good way of motivating participants to improve their own activities and learning but also a way of engage users during all the course.

The third pilot of the HANDSON project will be another opportunity to define and try out peer mentoring strategies and activities. The lessons learned during pilot 2 will be used to tweak the learning activities and the MOOC design and evaluate the refined approach.

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WHAT TO DO ABOUT MOOCS? BEYOND THE FEAR OF MISSING OUT

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Introduction

This paper reports the experiences and insights from those leading discussions around the development of Massive Open Online Courses (MOOCs) at Dublin City University (DCU). In offering an insider's perspective the paper shares some of the drivers and deliberations that have taken place at DCU in developing a strategic response to the challenges and opportunities presented by the MOOC movement. A description of the key drivers, strategic deliberations and major decision points at DCU is provided along with a brief outline of several MOOC options. In reflecting on DCU's experience, the paper describes the value of a decision matrix and concludes with a number of guiding questions framing strategic decisions about the adoption of MOOCs.

Despite predictions the MOOC movement is a metaphorical *avalanche* (Barber, Donnelly & Rizvi, 2013) that will transform higher education, relatively few institutions are offering such courses. Allan and Seaman (2014) report from their survey of colleges in the United States (US) that the majority of institutions (53%) are still undecided about whether to develop MOOCs and one-third (33%) have no plans in this area. They also report the proportion of higher education institutions offering MOOCs is only around 8%, which is up from 5% the previous year (Allan & Seaman, 2014). Moreover, only 23% of academic leaders who responded to the survey believe that MOOCs represent a sustainable model for offering online courses. Arguably, what the above findings indicate is that many universities (at least in the US) are sitting on the sideline of the MOOC movement or may still be deliberating on an appropriate response.

The latter description reflects the case at Dublin City University (DCU), as although we have yet to commit to a particular MOOC platform there is a strong intention as a modern, digital-era University to be far more than a passive observer. To this end, the University is actively participating in two European funded MOOC projects (HOME & SCORE2020) and over the last 12 months has been identifying key internal drivers relevant to the most appropriate strategic response. In parallel to this work we have been evaluating a range of platforms that

offer the best strategic fit for any potential MOOC initiative. Drawing on this experience, the remainder of the paper shares an insider's perspective on recent MOOC discussions at DCU, including our drivers, platform options and guiding questions, which may be valuable to other institutions at a less mature stage in the deliberation process.

Background

DCU was founded in 1981 and comprises over 12,000 students. With the current Incorporation Project involving the merging of three independent Colleges of Education, and the creation of a new fifth Faculty of Education at DCU, the student body will increase by another 4000 students.

The institution has a reputation as Ireland's *University of Enterprise* through its strong, active links with academic, research and industry partners. Innovation is at the core of its institutional culture and DCU is an active member of the European Consortium of Innovative Universities (ECIU). Internationally DCU is ranked 366 in the 2014 QS rankings and has been ranked among the world's best in the QS league table of the world's young universities – QS World Top 50 under 50 University Rankings (ranked 44 in 2013).

DCU has offered distance education for over 30 years and previously hosted the National Distance Education Centre, which later became known as Oscail. The term *Oscail* translates to 'Open' in the Irish language and reflects DCU's commitment to extending access to higher education through more flexible models of learning. The University continues to play a leading role nationally in the provision of distance and online education, evidenced by the establishment of the National Institute for Digital Learning (NIDL) in November 2013. Notably, the NIDL hosted the first National MOOC Symposium in May 2015 and is currently supporting Ireland's first Horizon Report on future trends facing higher education.

The goal of widening access to higher education through the development of a 21st Century *Digital Campus* is a core feature of DCU's strategic plan. *Transforming Lives and Societies (2013 – 2017)* (DCU, 2012) provides a strategic framework for significant growth in the provision of online and blended learning across all faculties. Importantly, this growth is being led by a strong pedagogical focus as DCU endeavours to offer a more interactive, collaborative, media rich and personalised learning experience.

Strategic Drivers

Why would any higher education institution contemplate launching a MOOC initiative? Allen and Seaman (2014) report the two most cited reasons for introducing MOOCs are marketing-related: (i) to "increase the visibility of the institution" and (ii) to "drive student recruitment". Interestingly, universities with the most extensive traditional online offerings were also those most likely to say that they are embracing MOOCs to "increase the visibility of the institution". In contrast, Colleges with no current online offerings report MOOCs will be used to "drive student recruitment" (Allen & Seaman, 2014). Over one-third of institutions with current or planned MOOCs cited reasons related to course design issues, including a desire to

“experiment with innovative pedagogy” or “provide more flexible learning opportunities”. Relatively speaking Allen and Seaman (2014) found there was less support for other goals, such as “reaching new students”, “supplementing on-campus” activities, potential “cost reductions”, “learning about scaling”, and “generating income”.

Holland and Tirthali (2014) report a similar trend from interviews with 83 educational leaders across a range of predominantly US-based institutions. Notably, 65% of institutional leaders report that “extending reach and access” was a key reason for offering MOOCs, followed by 41% acknowledging the value of “building and maintaining their brand”. In addition, they found that “promoting innovation” (38%) and “improving educational outcomes” (38%) were important factors influencing decisions to develop MOOCs (Holland & Tirthali, 2014). In contrast to Allen and Seaman (2014), the goal of “improving economics” (38%) (i.e., potential cost savings and/or generating revenue) was identified as an important longer-term goal. Also Holland and Tirthali (2014) report the goal of “supporting research on teaching and learning” (28%) was a consideration, with a particular emphasis on improving participant engagement and completion rates. Importantly, there appeared to be ‘less effort on determining whether learners actually gain new skills and knowledge from the courses’ (Holland & Tirthali, 2014, p.11).

Conor (2014) provides a more detailed analysis of the institutional policy drivers and change dynamics based on the experience of introducing MOOCs in three Australian universities. Through interviews with senior academics and analysis of policy documents, four commonalities were identified from the institutional constructions of MOOCs: (i) the use of e-learning policy was seen as a vehicle for curriculum redesign; (ii) an emphasis on internal curriculum redesign and transformation of the student learning experience was a core rationale for MOOCs; (iii) there was a desire to capitalise on promotional opportunities but at the same time a reticence around wholly embracing the phenomenon; and (iv) the absence of access-driven concerns in university policy despite the prominence of the goal of widening participation in broader public debate about the potential of MOOCs (Conor, 2014). This disconnection from the ‘extending access mission’ that strikes at the core of the new openness movement is explained in that:

“e-learning policies are being used as instruments to drive broader changes in curriculum and curriculum design practices at these institutions, that curriculum leaders see concurrent opportunities for curriculum renewal and institutional promotion in relation to MOOCs, but that they have concerns about what MOOCs represent for the university, and are reluctant to embrace narratives that promote changes to access and traditional enrolment practices” (Conor, 2014, p.633).

Developing an Institutional Response

In the case of DCU, all of the above goals and drivers have been discussed over the last 12 months, including the key tension between promoting wider access to higher education to increasingly diverse and geographically dispersed people who might not normally be able to study, whilst protecting the University's international reputation. In unpacking this tension and analysing the pros and cons of whether or not to develop MOOCs, we believe there is little doubt that an initiative in this area has potential to enhance DCU's reputation as one of Ireland's leading online/distance education providers. Moreover, a well-developed MOOC programme might help to position DCU as a global player in this burgeoning area. After all, as shown by Allan and Seaman (2014), very few US universities have launched MOOC initiatives and proportionally the number is probably even less in Europe. Set against the new global higher education landscape, joining a MOOC platform offers the opportunity for DCU to promote our existing online programmes to a wider audience, which may, in turn, help to recruit prospective international students (either on-campus or off-campus) to degree programmes in key areas of world-class research expertise.

The crucial point is that the goal of recruiting new students and enhancing DCU's international reputation for quality are not mutually exclusive from our tradition of promoting wider access to higher education. All of these drivers are firmly rooted within and articulated throughout DCU's institutional mission of *Transforming Lives and Societies*.

In this regard any decision to develop MOOCs will be part of a larger strategic development linked to the establishment of a new *DCU Connected* (<http://connected.dcu.ie>) brand, which was formally launched in August 2014. With a strapline of 'A quality education wherever you are', the development of a suite of online short courses to extend the University's outreach and reputation alongside our stable of existing online degree programmes, under the umbrella of *DCU Connected*, is seen as a logical extension of this initiative.

Importantly, the term *Connected* was deliberately chosen to shift the focus to the learner experience rather than a particular delivery methodology. We believed the adoption of something like *DCU Online* would be inherently institutionally centric and increasingly passé in today's digital world where online learning is becoming the new normal. Also true to our mission, *DCU Connected* has a philosophy of working with strategic partners to develop customised, locally relevant and digitally enhanced courses and programmes for a diverse range of students, irrespective of geographical location. For this reason, *DCU Connected* incorporates a number of the University's significant transnational activities, including a strategic relationship with Princess Nora Bint Abdul Rahman University in Saudi Arabia, where DCU is contributing to local capability development in a university for women. Another noteworthy partnership is with Arizona State University (ASU), the largest public university in the US, where DCU is jointly developing a number of online courses, including a Masters in Biomedical Diagnostics.

In addition to the above high-level strategic drivers, the decision to pursue a MOOC agenda is being significantly influenced by DCU's commitment to creating a modern *Digital Campus* which enables a culture of innovation and the goal of providing students with a 21st Century learning experience (DCU, 2012). More specifically, the MOOC is viewed as part of a wider ecology of innovation (Weller & Anderson, 2013) that may help with the step change DCU is aiming to achieve through curriculum redesign and increasing capability in new digital pedagogies. In terms of the wider innovation agenda, supported by the NIDL, it needs to be noted that in weighing up different MOOC options considerable value is placed on the chance of collaborating in a consortium of institutions in order to learn as much as possible from the experience. Hence there is also a research dimension to our interest in MOOCs, which is one of the reasons why we have chosen to play a role in the European funded OpenUpEd initiative.

Lastly, another benefit of developing a suite of MOOCs is the potential they offer in terms of transition education and more particularly first-year retention and learner success (Vihavainen et al., 2013). This goal is not something explicitly identified in the aforementioned research on the drivers influencing decisions at other institutions. The focus is a little different as we believe brief online taster courses, which showcase different subjects, may help prospective students to select the right degree programme by gaining a better sense of the discipline and what is required to be successful (Carson et al., 2012). Moreover, a free online taster course may help prospective students to better understand the career opportunities from pursuing study in the discipline. Such knowledge is an important factor in shaping programme choice and ultimately student success. In a similar vein, MOOCs are perceived to have potential value in promoting student readiness, especially in terms of understanding how to be an effective online learner.

In summary, *DCU Connected* provides an overarching strategic platform that encapsulates the mission of extending access to higher education and transforming lives and societies by harnessing the technical and pedagogical affordances of new digital technologies. It follows that the potential of MOOCs in promoting openness, life-long learning and increased participation in higher education aligns with DCU's mission. Another primary driver for DCU's interest in MOOCs is around fostering innovation, curriculum renewal and professional development in the areas of online and blended learning in accordance with the stated goals of our Strategic Plan. Following on from this point, through a research and development programme supported by the NIDL, the University is keen to transfer pedagogical lessons from the use of MOOCs to enhancing the student experience. Finally, MOOCs are also seen to offer potential for DCU to support readiness for university study and successful transitions, particularly for at risk learners.

Reviewing the Options

Over the last 12 months the NIDL has been investigating the technical, pedagogical and strategic affordances of a number of MOOC platforms, which are briefly outlined below.

Alison

ALISON, which stands for Advance Learning Interactive Systems Online, is an Irish based initiative that claims to be the world's first and original MOOC platform (<http://alison.com>). Founded in 2007, ALISON reports that over 3 million learners have participated in one of their courses, which are offered on behalf of, and in partnership with, a number of major companies, including Google, Microsoft and MacMillan.

Open2Study

Over the course of 2014 several discussions took place with Open Universities Australia (OUA) about joining the Open2Study (<https://www.open2study.com>) platform. Two options were explored: (i) joining the existing group of mainly Australasian institutions using the platform; or (ii) negotiating a license to purchase a clean skin version of Open2Study to launch a new Irish/European branded MOOC.

FutureLearn

FutureLearn (<https://www.futurelearn.com>) was established in December 2012 as a private company wholly owned by The Open University in the United Kingdom (UK). The number of partner institutions has steadily grown and FutureLearn claims to now support over 20 of the best UK and international universities. That said, the majority of member institutions still come from the UK, with many part of the so-called 'Russell Group', and so far FutureLearn has yet to establish a strong US foothold.

OER universitas

The OER universitas (<http://oeru.org>) is a global network of more than 30 universities, colleges and polytechnics collaborating to develop free online courses to provide a unique pathway to formal academic qualifications. The initiative has attracted donor funding from The William and Flora Hewlett Foundation and is supported by UNESCO and the Commonwealth of Learning. The OERu is founded on the principles of outreach and community service and has a mission of using solely Open Educational Resources (OER) to provide free learning pathways to people without access to traditional university entry.

Udemy

Udemy (<https://www.udemy.com>) is a commercial platform that claims to contain over 18,000 courses. This high number is partly explained by a model which provides very little barrier to entry to providers allowing individual teachers to easily sign up and create their own courses. Course creation is free and Udemy's business model is based around a split share of fees with courses ranging in price from free or a few (US) dollars to several hundred.

Notably, Udemmy also offers a clean skin version of the platform, which is primarily based on Moodle.

Iversity

Iversity (<https://iversity.org>) claims to work in close cooperation with teachers, universities and knowledge-based companies to build high-quality free online courses. The stated aim is not to replace the university but to empower individual academics to offer courses in their specialist subjects. In this respect the model is not dissimilar to Udemmy where the focus is on providing a portal for courses rather than a MOOC platform for enterprise-wide institutional initiatives. Having said that, because Iversity is based in Europe, it can potentially take advantage of the European Credit Transfer System (ECTS).

Tata Corporation

In November 2014, a high-level delegation from the Tata Group (<http://www.tata.com>) visited Ireland to discuss the idea of offering their purpose built MOOC platform to help make the Country the world's leading provider of online learning. The Tata Group, founded in 1868, is a global enterprise headquartered in India, and comprises over 100 operating companies, with operations in more than 100 countries across six continents. The delegation attracted considerable media interest and met with senior politicians, government officials and university leaders, including the President of DCU. These discussions are now continuing with DCU and the NIDL although at this stage we have yet to define the business model.

Open Source Options

Several open source options for course online course delivery are already available, including Moodle and OpenEdX. A standard or customisable version of Moodle could be deployed with the advantage that DCU already has considerable experience is using this platform. On the other hand, EdX has the advantage of being a purpose designed MOOC platform that supports local customisations. Moreover, EdX is currently being used for MOOC delivery by a number of well-known universities and there is a growing community of users. Also an external hosting option is available for OpenEdX through Edcast (<http://www.edcast.com>), which DCU is currently piloting.

OpenUpEd

DCU is already a 'partner in planning' for the European funded OpenUpEd initiative (<http://www.openuped.eu>). OpenUpEd reflects a particular philosophy of *openness* and offers a portal for aggregating MOOCs rather than a technical platform. In contrast to other MOOC initiatives, OpenUpEd values and promotes diversity of design and delivery by supporting courses in different languages and through a variety of platforms. In other words, the distinguishing feature of this initiative is that each partner institution uses its own digital platform rather than a common or purpose built MOOC. Although OpenUpEd currently claims to have around 170 courses in 12 different languages, the lack of common software architecture and supporting infrastructure makes this option somewhat problematic. At this

stage, however, DCU remains committed to OpenUpEd, as the overarching philosophy is consistent with our mission of transforming lives and societies.

Finding the Right Fit

All of the above MOOC options have advantages and disadvantages and the only way that DCU has been able to fully evaluate their strategic fit for purpose is to review the functionality, sustainability, business model, strategic affordances, and so on, of each platform using a decision matrix.

To guide this decision process we have developed a set of key questions that institutional leaders responsible for weighing up the pros and cons of different MOOC initiatives need to consider. The following questions are not intended to be inclusive of all the situated and contextual factors relevant to other institutions as they primarily reflect the strategic drivers identified from the DCU experience.

- How technically fit for purpose is the platform?
- How pedagogically fit for purpose is the platform?
- How sustainable is the business model for the platform?
- How reputable are the partners associated with the platform?
- How well is the platform suited to supporting academic readiness?
- How well does the platform support innovative forms of pedagogy?
- How strong is the pedagogical community supporting innovation through the platform?
- How well suited is the initiative to promoting the goals of outreach and wider access to higher education for all?
- What will be lost if we do nothing? What are the opportunity costs associated with the initiative?
- What are our measures of success? How will we know whether the MOOC platform has met our success criteria?

A decision matrix with different weights assigned to the above questions according to significance has helped to provide a more thorough and trustworthy evaluation of the relative merits of each MOOC option. This approach assigns a score to each question from low to high, multiplied by the respective weight, to help calculate an overall total for each MOOC platform. While there are other qualitative factors that need to be considered in reaching a decision on the most appropriate MOOC option for DCU, this type of decision matrix serves as a valuable tool for evaluating such a rapidly evolving area of innovation.

Conclusion

This paper has given a brief account of the MOOC debate. Against the backdrop of this debate the key drivers, deliberations and decision points that have faced DCU in evaluating different MOOC options have been described from an insider's perspective within a single institutional context. What is clear from this micro level experience is that a rational for investing in MOOCs based on the 'Fear Of Missing Out' (FOMO) does not provide a strong or sustainable argument for committing valuable resources to this area innovation. Any strategic decision to invest in MOOCs needs to be weighed up against the opportunity costs of pursuing other innovations, as teachers and academic leaders may be distracted from more important work. Where DCU goes from here has yet to be determined but there is a strong desire to learn from, and contribute to, the evolution of the MOOC movement. Put simply, DCU intends to continue to play a leading role in new models of online, blended and flexible learning. However, the challenge of weighing up and prioritising competing institutional drivers, along with the complexity of choices facing universities in the age of the MOOC, should not be underestimated. There are significant financial and reputation risks. With this last point in mind, the particular contribution of this paper is that it offers insights into a number of strategic questions about MOOCs, which we hope may help guide future decisions in other institutions.

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GAMIFYING MASSIVE OPEN ONLINE COURSES WITH ELGG: AN EXPERIMENTAL STRATEGY DESIGNED FOR THE ECO PROJECT

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Introduction

Massive Open Online Courses (MOOCs) are a disruptive new trend in education. They are so called because they brought together the scalability and the openness elements to non formal education. In fact, MOOCs are scalable as they are intended for several thousand participants; they are open, since enrolment is free of charge and there are no admission barriers, constraints or procedures; and they are online because participants use the Internet to access content, resources and assignments, and to interact with other participants [1, 2].

The first MOOC was offered in 2008 [3], but the concept became widespread in 2012 when many universities, taking a different approach to this type of course, started delivering their own MOOCs [4], exploring the idea of providing an opportunity for all to learn based on the materials provided at no cost by some of the top universities [5]. This proved to be an exciting and popular formula, attracting an excess of 100,000 participants in some of the courses offered, for instance by Coursera and Udacity [3].

However, designing and running a MOOC involves also tackling several logistical, technological, pedagogical and financial issues [6], one of the most known and important being the dropout rate. Given the fact that participants do not invest money in enrolling in a course, it is even easier for them to drop it at any time without facing any of the consequences typically experienced in traditional courses [7]. Participant expectations and goals regarding their learning output in MOOCs are substantially different from conventional formal education. This also implies that completion rate is extremely low (between 5% and 20% [4, 8, 9]) when compared with traditional formats, which makes it challenging to determine whether MOOCs are successful [8, 10].

On the other hand, over time education researchers have conducted many studies on the videogames subject, both theoretical and empirical. These studies have exposed many potential advantages of videogames in education like immediate feedback, information on demand, productive learning, motivating cycles of expertise, self-regulated learning or team collaboration [11, 12]; but also some issues related to educational content, learning transfer, learning assessment, teacher implication and technological infrastructure [13, 14, 15].

Due to the aforementioned issues, some researchers do not use only videogames to educate; they seek to export the positive aspects of videogames to non-gaming educational contexts. This concept is commonly called “gamification”. Some researchers generically defined it as the use of game design elements and game mechanics in non-game contexts [16, 17], although this broad definition has been further redefined to reflect the most common objective of gamification: increase user experience, facilitate engagement with a system and motivate actions [18]. Attending to these facts, it could be more accurately defined as incorporating game elements into a non-gaming software application to increase user experience, engagement and motivation.

Gamification has successfully been incorporated with commercial purposes into platforms (e.g. Badgeville, <http://www.badgeville.com>), in order to create relationships between platform and users, and to increase platform popularity. This success suggests that it could also be used in education as a tool to increase student engagement and motivation [19]. Furthermore, because of its technological nature, one of the fields where gamification may have a greater impact is online learning, especially in its emerging open formats such as MOOCs. Its potential benefits may address some well-known key issues as, for example, the lack of student motivation due to the limited (sometimes even zero) capacity of interaction with teacher and classmates, in xMOOCs [20], or the need to create a strong and dynamic learning community, in cMOOCs. In addition, the monitoring and communication infrastructure of e-learning platforms (including some specific to MOOCs) provides the necessary tools to incorporate different gamification mechanisms and to measure their usage by students [16].

Moreover, gamification is a relatively new field with a promising potential that teachers and researchers are just beginning to unveil. Due to this, there has been recently an increasing number of studies in the use of gamification in e-learning that analyse its potential impact on learning outcomes. A recent literature review reported that education is the most common context in which gamification is implemented and that, although results are mostly positive, some caveats exist [21]. Positive effects have been reported in learning performance, participation and attitude of students [16, 22, 23].

Gamification seems thus to be a natural next step towards the development of engaging and collaborative learning experiences, making it ideal for MOOCs, where learning experiences are of this type. Furthermore, since motivation is one of the advantages of gamification, it would be desirable to apply it to MOOCs in order to increase the motivation of students and to decrease the dropout rate. Therefore, this paper presents the gamification strategy developed by an international team for use in the sMOOCs developed by Universidade Aberta (Portugal) in the framework of the ECO project partnership which draw their pedagogical approach from the iMOOC pedagogical model created by Teixeira and Mota [24].

Section Background presents the Elgg framework, the MOOC environment currently used. The following section shows the gamification strategy divided into two approaches. Finally, brief conclusions and future work are described in the Conclusions section.

Background

Universidade Aberta (UAb) of Portugal has been implementing an innovative methodological model called iMOOC [24]. This model is the first institutional pedagogical model developed specifically for MOOCs and focus on four main features: learner-centeredness, flexibility, interaction and digital inclusion. It combines autonomous and self-directed learning with a strong social dimension, and tries to articulate the flexibility that distance online learners need with the pacing necessary to help them get things done.

According to the iMOOC model, learning should be evidenced through the creation of artefacts freely accessible online, which demonstrate the learner's knowledge and competencies regarding the material studied. Learning support rests on the learning community, through collaboration, dialogue, peer feedback and active engagement from participants in the learning process. The course starts with a “bootcamp” module that lasts one additional week, intended for participants to get acquainted with the spaces, tools and services, as well as with the processes of work and communication that will be used in the course.

Using this methodology, graded assessments are included for participants who want to receive a certificate of completion of the course. At least two of the artefacts produced as evidence of learning by participants will be assessed and graded through a peer-review system – those who wish to participate in the peer-review assessment will grade the artefacts produced by three other participants and have their artefact graded by three other participants. The final grade will be the average obtained in the three grades given. Every assessment will be based on a detailed rubric provided by the professor or professors leading the course.

Based on this methodology and on its use by the ECO project, which led to the development of a new approach called ECO sMOOC, an ECO iMOOC environment (eco.imooc.uab.pt) was designed, serving as a test bed for a number of pilot courses such as “Digital skills for teachers” (Figure 1). This environment uses the Elgg framework for providing social networking and community building functionality in the course (e.g. friends, stream, blogging, microblogging, etc.).



Figure 1. ECO iMOOC with a pilot course (in Portuguese)

The environment has already run a first version/generation of the courses, but a second version/generation will be released introducing a gamification component. To achieve this, a gamification strategy was developed which is presented in the next section.

Gamification strategy

The idea of gamifying a course is to introduce some game elements for increasing engagement and motivation of students in courses. This strategy is divided into two steps: the first approach is to introduce some elements such as Achievements, Leaderboard and Store. The second approach is to introduce the concept of Open Badges for obtaining more visibility with the awards. All elements of the first approach have been experimented in different learning courses with positive results [16, 25], although different pilot courses will be created for testing the results of this gamification strategy.

First approach

This first step introduces the concepts of Achievements, Leaderboard and Store.

Achievements

A list of different achievements is showed to the students (Figure 2). These achievements have to be completed during the course. Some of these are, for instance, “Add an image to your profile”, “Make 15 comments in the platform”, “Complete all tasks about the topic ...”, etc. When a student successfully completes an achievement he/she receives an amount of points that can be used in the Store. The amount of points received for completing an achievement depends on the kind of achievement.

Gamifying Massive Open Online Courses with Elgg: An Experimental Strategy Designed for the ECO Project

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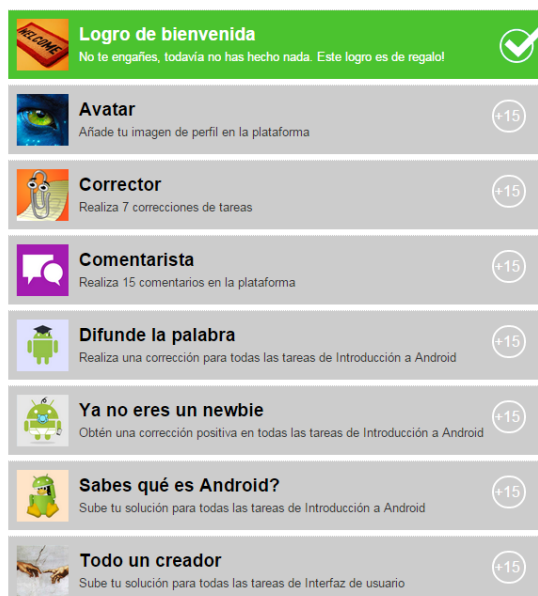


Figure 2. Example of a list of Achievements in a gamified course (in Spanish)

Leaderboard

Various rankings are showed with different statistics, such as the number of points obtained (i.e., number of Achievements completed), number of comments in the platform, number of friends and number of Tweets (short-messages) (Figure 3). More rankings with additional statistics can be added.

These rankings are automatically updated and the students usually try to be in the highest position possible in the ranking. Therefore, this motivates them to remain active in the course.

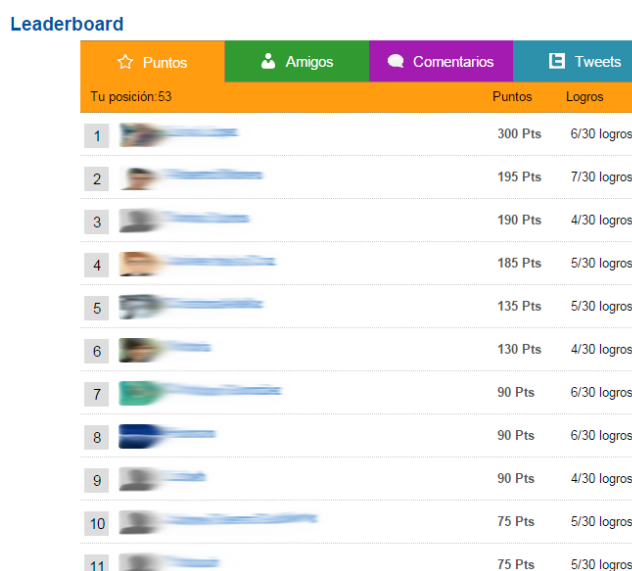


Figure 3. Example of leaderboard showing the ranking of Achievements completed (in Spanish)

Store

The points obtained after completing the different Achievements can be used in the Store (Figure 4). There are different elements in the Store that can be purchased by the students, such as extra points in their grades (with a maximum, because the objective is not to purchase their grade, only some extra points). Other elements that can be purchased allow them to get more visibility in the platform, such as including a personalized image in their profile as a background or to highlight notifications of activities (highlighting the student's activity with more visibility with respect to the others). The elements of the Store motivate the students to complete the Achievements and to get more points.

Artículos disponibles



Figure 4. Example of Store with the different available elements (in Spanish)

Second approach

The second approach includes the first step of the gamification strategy but introduces the concept of Open Badges (openbadges.org). The idea of these badges is to get more visibility and appreciation of the achievements completed in a course. In the first approach the achievements completed are in a local context (they have only appreciation within the course), but badges can be shared with friends or showed in different applications such as Mozilla Backpack (backpack.openbadges.org), so they can be considered in a global scope.

An Open Badge is composed of an image and a file with metadata (this file includes the information of the badge, e.g. the owner of the badge, the institution that grants the badge, the achievements completed by the owner, etc.).

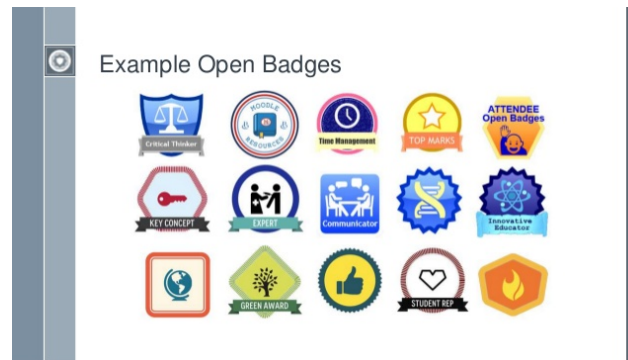


Figure 5. Example of a user's Open Badges in a Backpack application

This approach proposes to create groups of Achievements in the platform and when the whole group is completed by a student he/she receives an Open Badge, which can be added to his/her backpack and shared with their friends and family. This way the students will be motivated to get all Achievements and finish the course to certify their skills by obtaining Open Badges that are visible in a more global context.

Conclusions

The gamification strategy proposed is divided into two approaches; the first one introduces basic game concepts that have been tested in different courses with positive results in the students. The second approach tries to introduce a more visible mechanism of appreciation of the achievements completed by the students (Open Badges). The aim of this strategy is to improve the motivation and engagement of the students in a massive open online course, increasing the level of sustained commitment by the participants. This will also likely decrease the dropout rate, which is considered by many as a drawback of MOOCs.

This strategy will be implemented in the ECO iMOOC using the Elgg framework and some MOOC pilot courses for getting results about the motivation of the students and continued engagement in the course activities, thus decreasing even further the dropout rate in these courses. These results will be compared with previous editions of the same courses in past years, in order to check whether these techniques have brought improvements. The possibility of integrating mobile devices in the courses will also be studied, as done in previous research [26].

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OPENSNH – DEVELOPING AN OER OPEN REPOSITORY TOWARDS MOOC

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Abstract

This paper concerns the main issues of the conference and, more specifically, deals with how open repositories can offer complementary services in relation to institutional and discipline repositories. In this paper presentation, we will describe how a service could be built to fill an identified niche and how it connects to related services. The approach taken for this specific open repository, OpenSNH (www.opensnh.se), will highlight the possibilities of offering open educational resources to the entire university sector in Sweden, thereby using the resources for education in a more sustainable way.

Introduction

In the last 10 years, there has been an increased interest in sharing resources for education in a more sustainable way. One of the initiatives that has gained a worldwide response is the development and sharing of Open Educational Resources (OER), which are often provided through different forms of repositories belonging to the educational providers that have produced them. In this presentation, we will describe the development of the OpenSNH repository (www.opensnh.se) through which two Swedish Universities and the Swedish Educational Broadcasting Company (UR) have chosen to provide their OERs under thematic topics that allow for use and reuse in different ways. In the OpenSNH platform, materials are included from several other Swedish universities, based on an agreement with OpenSNH. In the development of OpenSNH, efforts were made to develop tools and didactical scaffolds in the repository, thus turning the collection of OERs and their uses towards the production of mOOCs (mini MOOCs).

Background

This paper concerns the main issues of the conference and specifically how repositories can offer complementary services in relation to institutional and discipline repositories. In the paper presentation, we will describe how a service could be built to fill an identified niche and how it connects to related services. This approach is taken for a specific open repository, OpenSNH, to highlight the possibilities for offering open educational resources to the entire university sector in Sweden and thereby use the resources for education in a more sustainable way.

The term OER was first used in 2002 by the United Nations Educational, Scientific and Cultural Organization (UNESCO). Since then, it has gained increased attention and has been connected to different kinds of educational benefits (up to the point that *Distance Education* dedicated a special issue in 2012 to OER and social inclusion). Over the years, several issues concerning the use of OER have emerged (cf., Atkins, Seely Brown, & Hammond, 2007; Olcott, 2012). One seems to be that initially more efforts were put into the production and sharing of OERs than into looking at the successful adaption of existing materials in creating sustainable solutions for OER practices. In a recent article, Armellini and Nie (2013) propose a framework for using OERs as an open educational practice. In the article, they identify and discuss different barriers to the use and reuse of OERs. One of the key areas in their recommendations for systematic support and training for academics is in identifying relevant OER repositories, especially those containing subject-specific OER materials. In this paper presentation, we focus on one such repository in which the materials are ordered by thematic topics under different subject headings. International trends described in the *Horizon Report, 2015* (the higher education edition) provide us with options regarding “Increasing Cross-Institution Collaboration”. These options include reflecting on issues about the ways to collaborate and join in sustainable frameworks with other universities, with the goal to cooperate in OER production and build up open courses in general. The Unizin consortia (founded 2014) as an association is just one of many example with a non-profit aim based on prior metadata standards, learning analytics, etc. The NMC Academy (nmc.org) is another and different form of an organizational membership and is a global network with innovators from several universities/colleges, schools, and organizations around the world producing open mini-courses.

Developing an open repository into an mOOC

This paper presentation will describe the building of the OpenSNH repository towards mOOC (mini MOOCs) and the work of tagging the materials provided for the platform. The website OpenSNH has been created in collaboration with two commercial partners who both have experience in open source software and e-learning. The content for OpenSNH is related to a previous website for OER resources run by the network SNH, and today nine months after its launch, the site opensnh.se is in operation with 84 learning objects and four complete thematic topics.

Open source

OpenSNH was created with the open source software OMEKA.org used by several universities for teaching purposes. The OMEKA open source system has also been translated into Swedish. For the process of selecting items and OER for the themes in OpenSNH, we used the following criteria: lifecycle, provenience, originality, broadness, depth, prominence, reliability, and solidity (Commonwealth of Learning, 2011). The OER had to have previously been used in an academic educational context before or as an educational resource or in academic courses at an academic library. OpenSNH uses the resource description and metadata model Dublin Core Extended (2014).

Metadata

Using the metadata standard Dublin Core makes it easier to cooperate with partners such as the UR on the work of harvesting/importing learning objects directly into the OpenSNH repository from the UR. Educated librarians have done the work of adding metadata and search words (“tagging”) to the OER according to the standard for Swedish subject headings via the Nation Library of Sweden. So-called “enhanced metadata” have been developed using distinct and apparent images and pictograms for searching and identifying relevant resources such as videos, e-books, interactive resources, documents, quiz/tests, getting badges, etc. For better usability with mobile devices, we have chosen the theme of Berlin for OMEKA – this web interface is clean and responsive – and OpenSNH can therefore be used on all devices. OpenSNH has a search cloud for a better overview and selection of subjects and topics for the content and objects in the repository.

Together with the librarians, a collaborative routine has been established to improve the metadata and adapt this for academic learning objects that are placed in the Open SNH. The Swedish Educational Broadcasting Company can then use this improved metadata on its other websites, UR play and UR.se, and on the website UR access. Along with the Swedish Educational Broadcasting Company there are already plans to try out files by importing learning objects for radio and TV programs from UR.se to the OpenSNH. This will be more efficient and simplify and speed up the publication of learning objects from the Swedish Educational Broadcasting Company to the thematic topic pages in OpenSNH.

Accessibility

The aspect of accessibility is one criteria that we have prioritized so that both the website of the repository (OMeka) and the content (OERs) will be accessible to all students (according to 508 compliance standards). We are now investigating and testing the site with the published OERs and theme pages via the web accessibility evaluation tool WAVE. This is ongoing work to ensure that “all” learners benefit from the contents delivered via OpenSNH. We have also produced images/symbols (icons) for OERs that communicate when an OER is a video or a film, has subtext or interpretations, sign language/dactylology, and when the sound in the video is read aloud. All these special accessibility symbols and other OER symbols are open to use, share, and remix for other purposes. To allocate resources and support around accessibility is a long-term commitment to further quality assurance with the aim that nearly all learners will have their special needs fulfilled regarding searching, viewing, and learning from the OER, theme pages, and forthcoming mOOCs via OpenSNH.

mOOC (mini-MOOC)?

The name mOOC (mini-MOOC) can, as in other projects and MOOC-implementation, seem a bit of a “contradiction” in the general terms regarding MOOC. Some also call it limited open online course, or LOOC. We define mOOC as a shorter time period for learning (up to a month or so) and a more flexible variant than the traditional MOOC with a linear progression (one course module after another with quiz-type formative assignments and ending with a

summative assessment). Our aim is to create more flexible learning paths for learning by aiming at a nonlinear variant and instructional structure for the learners' progression. In this work, we have done a minor comparison matrix with several criteria that we want to share with other through EDEN. We compare a Swedish open course about the subject "source criticism" (*källkritik* in Swedish) and the OER course material you can find via OpenSNH within these fields of knowledge. The discussion is about how open MOOC is in reality when the material is locked up in a learning management system (LMS) and the learners have to authenticate themselves for the provider to use learning analytics, etc.

Integrating syllabus

The steps towards mOOC are not only a technical issue but also a pedagogical dilemma and an educational concept to discuss. If you take the side regarding the issue of a rationale, it raises several important questions about what ways we think MOOCs are sustainable. In planning, we now have to begin to investigate methods for producing a syllabus, a course schedule, and a course study guide for all courses to present activities and assessments for the theme pages and incoming mOOCs and assignments via a web tool for SALSA that creates a syllabus and flexible PDF files for building a syllabus, a course schedule, and assignments. These PDF files and the web tool are open tools with a CC-license and are part of The Open Syllabus Project. If MOOCs are just a test area to develop new examination and assessment models, is self-directed learning the central feature of MOOCs or do we create MOOCs only for the reasons that MOOCs increase institutional visibility? Or do we drive recruitment, generate income, and explore cost reductions to improve student retention? Are MOOCs just a recruitment tool or paths to other learning opportunities? What do MOOCs teach us about learning?

Use up to now

OpenSNH has shown very clear and visible results in a short time. In the work of adding content, librarians from both the universities and the Swedish Educational Broadcasting Company have been engaged in improving the quality of the metadata (bibliographic information) for each learning object, e.g., with a keyword, topic categorization, etc. This has been very successfully and will increase the searchability both on the open web using search engines like Google but also internally on the website OpenSNH. This allows different OERs to belong to specific thematic topics, depending on their content.

Based on the first period (2014) of being available, Google Analytics show that 4,745 unique visitors have accessed OpenSNH and they have collectively accessed the site 6,841 times. 32% of the visitors were returning visitors. The pages have been shown 24,637 times, with an average amount of 3.6 pages per visitor. Among the viewers on the website OpenSNH, 83% are Swedish. This shows good potential for gathering materials from different educational providers under thematic topics, and the materials attract and keep the visitors engaged. The thematic pages – theme pages about methods in science work and open digital educational resources (OER) – have been the most frequent entrance sides into the homepage of OpenSNH.

Conclusions

To summarize, the main message in this paper presentation is to demonstrate the possibility of using an open repository to gather OER from different educational providers and provide them in a thematic form for the entire higher educational system. This makes the materials more accessible and the resources for education are used in a more sustainable way. The steps towards the mOOC involve not only technical issues but also an understanding of the predicament about MOOCs' role in a broader educational context.

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EXTENDING MOOC CAPABILITIES WITH DEDICATED NETWORKS: THE E-PORTFOLIO TRAINING CASE

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Introduction

A recent survey (Elaine Allen & Seaman, 2015) on the state of the art of online higher education in the United States shows that academic leaders consider online learning a key strategic issue for their institutions, and this figure has grown from 48.8% in 2002 to 70.8% in 2015. The major role in education of online learning is also attested by international studies like the Docebo (2014) report that depicts the growing market tendency of e-learning worldwide.

There is a general agreement that online education, even if long-time pre-existing the advent of the Massive Open Online Courses (MOOC) phenomenon became mainstream after the 2012 disruptive appearance of elite universities in the open education arena. MOOCs kicked the board of a stagnating position of higher education now facing challenges coming from inner constraints but also from social and technological accelerated changes.

MOOCs variants, the search for novel forms of open education

Even if the MOOC movement recognizes a foundational moment in Siemens Connectivism and Connective Knowledge open course in 2008 (Daniel, 2012), it is widely known that AI-Stanford like courses (Rodriguez, 2012) has gained worldwide attention and great impact.

Liyanagunawardena, Adams and Williams (2013) systematic study of 5 years of published literature on MOOCs corroborated what Rodriguez (ibid.) MOOC analysis concluded: highly prevailing MOOC offer can be associated to AI-Stanford like type of courses (or xMOOC) which “fall predominantly into the cognitive-behaviourist category (with some small components from social constructivism)” (p.11).

This finding reinforces certain critiques on MOOCs as traditional ways of conceiving education packaged in new forms (Bates, 2012) where teachers are

“...the most relevant and reliable source of knowledge and information. As teacher presence is “mediated”, mediatization solutions point to chunking videotaped classes, providing a set of additional resources and learning activities, and assessing through more or less automated tests. This type of

MOOC privileges the knowledge transfer and duplication.” (Guàrdia, Maina & Sangrà, 2013, p.2).

The MOOC response is not to be neglected. MOOC are here to stay and to transform education, even transforming itself. There are several new acronyms reflecting this search for alternatives that highlight differences and similarities with the more popular MOOC:

- Mini MOOC (University of Exeter): while MOOCs usually last between 4 to 5 weeks, mini MOOCs are conceived for 3 weeks delivery with a 1 to 3 hours of participant involvement each.
- SOOC (Small Open Online Course) (Ross, 2012): these can be simply considered free online courses since they limit the number of participants to a very few.
- MOUC (Massive Open University style Courses) (Mulder, 2013): they are free graduate introductory courses that combine traditional Open University courses with more flexibility in terms of time and pace. They are self-study courses. Additional services like tutoring or evaluation are to be charged.
- TOOC (Targeted Open Online Course) (Baker, Rynearson & Edwards, 2014): they are professional oriented courses that can be credited in formal education. They are part of an institutional strategy aiming at establishing alliances between universities and local interest social groups.
- SMOC (Synchronous Massive Online Course) (Straumsheim, 2013): their particular trait is the teacher lectures in real time to a massive audience.
- DOOC (Distributed Open Collaborative Course) (Jaschik, August 19, 2013): this approach empowers the teacher's role that localizes high quality course structured content available on the web according to their specific reality and that of its students.
- SPOC (Small, Private Online Courses) (Goral, 2013): it can be seen as an online course at low price limiting the number of participants.

Even though the future of MOOCs is something to be written, there is evidence that claims for a new balance between formal and informal education and within formal education itself, like the those trends pointed out by Mazoue (2014) that “are shifting educational practice away from core tenets” (para.1): MOOC-based degrees, competency-based education, the formalization of learning, and regulatory reform. While not all are really new, as the author recognizes himself, a greater awareness on competency curriculum, shorter and focused courses or programs, and new regulations allowing lifelong skills recognition are now on the discussion agenda of higher education.

We already assist to original initiatives blurring boundaries between formal and new forms of education and blending open education with the traditional educational offer. Exploration of new formulas illustrate the case: embedding MOOC using a higher education blended approach (Griffiths, 2014) or adopting a flipped classroom approach where MOOC video lectures, exercises and quizzes supplement secondary school courses (Najafi, Evans & Federico, 2014).

Different needs, different motivations

The numerous initiatives, experiences and studies around MOOCs evidence an institutional concern and an intense debate of stakeholders in universities, educational organizations and government. But what are other studies telling us from the participants' perspective? The Haggard, Brown, Mills et al. (2013) report shows diversity in the intentions of enrolled people to MOOCs. The statistical analysis of the participants' behaviour let identified four distinctive profiles: auditing, sampling, disengaging and completing. It also showed a clear pattern of decreasing participation over course durations.

The new delineated scenario of MOOCs calls for a better understanding of the participants' motivations and actual needs. Arguments that try to make sense of MOOC impact in terms of traditional explanations of dropout rates are controversial (Ho, Reich, Nerterko et al., 2014). Many participants in MOOC declare to enrol for specific (bits) units or parts of a MOOC. They do not all have the intention to complete the course or they do not sign for recognition, but instead they declare to be interested in concrete competence development or being curious about specific knowledge. Some preliminary conclusions situate MOOCs and the evolving open education field as requiring a complete questioning of the way in which the educational offer is conceived, delivered, and measured... and explored.

Exploring transformative ways of educational provision

The European EPNET project (www.eportfolio.eu) aims at fostering e-portfolio practices for different actors from an integrative approach. We focus on the intersection between learning and professional stages of an individual trajectory, and we situate the e-portfolio as an asset useful to different stakeholders as broad as teachers, employers, governmental administrators and professional bodies. The project plans the provision of a MOOC-inspired open set of modules for self-regulated learning (Zimmerman, 1998).

Milligan and Littlejohn (2014) warn about the replication of traditional education into online and open learning. Their study of MOOCs for professional development showed how traditional ways of conceiving MOOCs were counterproductive: in xMOOC approaches professionals tend to focus on "viewing" content, gradually disengage in peer interaction, not establishing strong links between theory and practice, and completing assessment for the sake of certification. Lessons from this study reinforces the need to integrate course content and activities with actual participants professional needs, combine theory and practice, connect to real participant situations to easy knowledge contextualization and provide instruments for knowledge application and learning reflexion.

Based on MOOC research and documented experience, we paid attention to other conclusions that suggest avoiding recording long lectures or reifying content. To facilitate access we follow recommendations of moving away from rigid weekly pacing or even closed cohorts within time constraints (begin-end of the course). We also consider diversifying assessment diminishing the importance of automatic assessment and concentrating on learning outcomes and participants' productions for peer/social appraisal/discussion. And to better conciliate different audiences and interests we question curriculum linearity by allowing personalization.

Our proposal stands on seven independent modules aiming at providing conceptual and instrumental knowledge for the creation of an e-portfolio strategy and prototype solution, regarding individual or institutional objectives. They are structured as an activity-oriented flexible path:

- M1: Understand e-portfolios: an introduction and overview of e-portfolios.
- M2: Set the e-portfolio purpose/s: an exploration of the potential of e-portfolios and the establishment of personal purposes.
- M3: Outline an e-portfolio strategy: a strategic and programmatic decision on how the e-portfolio will help reach the purposes.
- M4: Design an e-portfolio ecosystem: an examination of different ways to implement an e-portfolio taking into account the evolving social web landscape.
- M5: Evaluate the e-portfolio solution: the development on an evaluation method and instruments to ensure the e-portfolio quality.
- M6: From the individual to an organizational initiative: an oriented process of transforming e-portfolio individual initiatives into organizational projects.
- M7: From programmatic to systemic change: an exercise of rethinking e-portfolios and their impact not as an isolated project but as organizational paradigm change.

Modules are organized around activities linking theory and practice. Conceptual content is presented in rich media formats using a variety of sources including videos, online presentations, interactive content, and readings. We have identified quality open educational resources for reuse and we have elaborated a set of valuable documents that will be used in the course. We have developed an extensive literature review for the development of an e-portfolio matrix as a conceptual and instrumental artefact supporting reflection and decision making around e-portfolio implementation (Maina, Guàrdia, Alsina & Barberà, 2014) (useful in modules 2, 3, 6 and 7). Another important resource elaborated within the project is a set of implementation guidelines for teachers, organizations and consortia (of particular interest for modules 6 and 7). Last, we have written a competency recognition and accreditation framework of value for all modules.

All content is free of use. Each activity is provided with illustrative examples showcasing diverse situations and cases of e-portfolio use. We follow principles of scaffold learning applied to online learning by means of supporting instruments. Most of the activities are accompanied with templates and guidelines.

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To support the sense of ownership the participant is encouraged to set its personal goals and decide on the number of modules to take and the pace for doing so.

The modules will be delivered in first place as a MOOC within the EMMA platform, a development of the homonym European project (www.europeanmoocs.eu). This action is understood as an initial open cohort that launches the initiative. The first MOOC iteration will have an official end but the learning space is intended to rest opened with a non-stop enrol approach. Dron and Anderson (2014) typology of social forms of learning clearly states the interplay between different level of social interventions for learning ranging from the individual predisposition to interact, to “groups”, to “nets” (connections of “nodes—such as people, objects, or ideas—and edges”, p.76) and finally “sets” (“made up of people who are bound together by commonalities or shared interests”, p.77). This MOOC is part of a greater effort within the EPNET project which has established a network of interested people and that interacts through the Europortofolio portal (europortofolio.eu) and a set of local chapters (Figure 1).

We envision providing an environment that connects the learning space (MOOC) with the Europortofolio network. This environment will support lasting debate spaces, open folders for participant-productions’ sharing, and functionalities for easing social interaction: RSS feeds notifying content addition, notifications of new messages to interest-focused groups, list of contacts with associated digital profiles. Once a person enrolls and registers to this interrelated environment, it may benefit from previous participants contributions, and in turn contribute to the growing of the community and the publishing of its own productions and ideas.

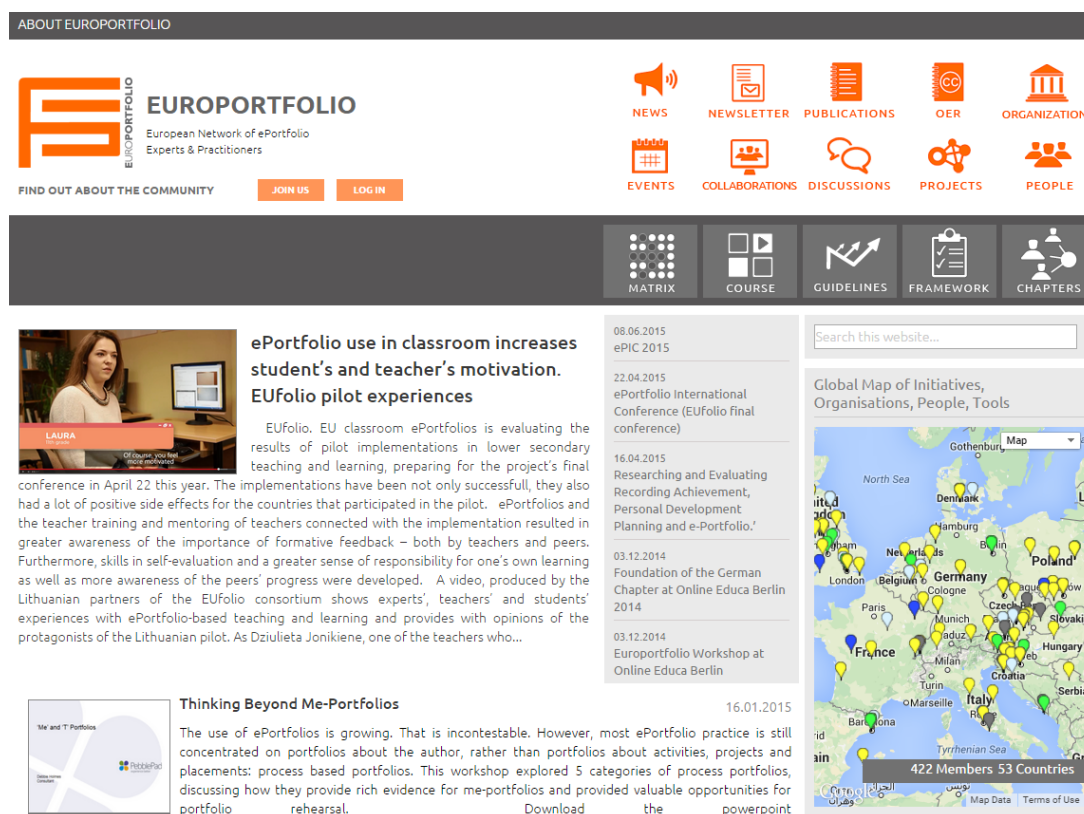


Figure 4. A view of the Europortofolio portal giving access to resources and the Network

Final remarks

This paper presents new ways of expanding learning scenarios by means of an extended MOOC that differentiates from traditional ones in several ways. Firstly, it is the result of a coordinated effort of organizations, including three different and directly involved universities. Secondly, it is inserted in a broader action of fostering e-portfolio adoption through the creation of a European network of experts, researchers and users. Thirdly, it makes use of innovative scaling up pedagogies for crowd learning, focusing on scaffold and self-regulated learning together with the implementation of the latest notions of social learning including net and set learning. Finally, it pretends to act as a synergy element of the network, both providing and nourishing from each other.

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THE POTENTIAL AND THE CHALLENGES OF THE OPEN WEB IN THE DOCTORAL JOURNEY: THE GOAL ORIENTATIONS OF ITALIAN AND UK PHD STUDENTS

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Introduction

The current PhD candidates are increasingly expected to act as “doctoral researchers” rather than as “doctoral students”. Challenged by pressures coming from globalization process and knowledge economy, the PhD candidates are in fact required to develop self-entrepreneurial skills, in order to define their own research projects and even to craft any future job positions inside or outside academia (Cornelissen, Simons & Masschelein, 2007). Alongside, they are provided with unprecedented opportunities to draw advantages from the ensemble of the Web 2.0 tools and services, embedding a potential for enabling at an individual level new forms of knowledge creation and knowledge circulation and distribution across academic contexts (Cobo & Naval, 2013). In other words, the PhD candidates are supposed to build on the pervasiveness of social media and ownership of digital devices to take “greater agency in the creation of their learning contexts” (Luckin, Clark, Garnett et al., 2010, p.74), as well as academics of all ranks are subject to techno-cultural pressures (Veletsianos & Kimmons, 2012) to experiment new participatory behaviours across digital venues. However, the actual uptake of the Web 2.0 tools and social media by the doctoral students is still controversial (e.g. James, Norman, De Baets et al., 2009; British Library/JISC, 2011; Esposito, Sangrà & Maina, 2013; Petre, Minocha & Barroca, 2014), whilst some discussions related to opportunities and drawbacks of social media for the PhD students have recently been sparked (e.g. Coverdale, 2012; Zhu & Procter, 2012).

Considering these emergent issues, we hold that the new learning scenarios for doctoral education should be more permeable to the emerging forms of knowledge production and distribution and should look at the current self-organized practices in the digital by doctoral researchers as an informed basis to critically innovate research training. In particular, focus of this paper is on the dispositions of the PhD students toward the open Web, as arising from the free comments received in the initial, exploratory online questionnaires delivered across three Italian and one UK universities. We have highlighted some commonalities and differences in the perceived benefits and drawbacks of social media adoption, building on the open comments released by individual Italian and UK participants in the respective e-surveys. More importantly, we have applied data triangulation across diverse contexts, according to the

grounded theory principle of the constant comparative method: this approach has also allowed us to scaffold the identification of a set of PhD researchers' Goal Orientations toward the open Web. This paper underlies the assumption that the investigation of the self-organized student experiences in the digital is the necessary premise for shedding light on the new scenarios of personal ecologies (Andrew & Haythornthwaite, 2011) of people and resources in the open Web as emergent forms of e-learning in higher education (Ellis & Goodyear, 2009). In the following sections, we firstly provide an overview of the applied methodology, then we summarize the main findings under the empirical categories of Benefits, Criticalities, Inhibitors and Individual Perspectives; finally, we discuss the conceptual categories of the PhD students' Goal Orientations. As final remarks, we suggest some hints for further research.

Methodology

The open comments considered in this paper were received during an exploratory e-survey, generating two non representative samples of 653 Italian and 44 UK PhD students: the dataset is comprised of 533 unique comments for the Italian version and 94 for the UK version. The related contributions vary from one single word to entire paragraphs and are related to the group of survey questions focusing on the perception of the potential of the open Web in broad research activities such as research project management, data collection, networking, dissemination, keeping up to date and online construction of one's own academic profile. The comments received from the two samples of respondents were grouped in two respective files and separately analyzed, starting from the Italian sample's data set. The coding activity has followed the typical process of grounded theory data analysis (Gibson & Brown, 2009), where an initial data-oriented approach is subsequently complemented by a more concept-oriented analysis. The initial data-oriented phase has generated four main empirical categories: Benefits, Criticalities, Inhibitors and Individual Perspectives. The subsequent phase has embedded an abductive logic, where we have combined the achievements arising from empirical data and our theoretical interest in gaining insights about the capacity of the PhD students of acting upon or being acted upon the open Web. In this endeavour, we have re-aggregated the codes subsumed under the aforementioned categories, in the aim of drawing the conceptual categories expressing the prevalent attitudes of the PhD students toward the open Web: Pioneering, Coping, Waiting for the mainstream, Rejecting.

The findings: the opportunities and the challenges of the digital

The following sub-sections summarize the accounted Benefits, the factors that are likely to prevent (Inhibitors) or slow down (Criticalities) the uptake of new digital tools and the stated individual perspectives about the role of the digital in the doctoral journey.

Benefits

The Italian and UK survey respondents share the perception of the open Web as an efficiency-enabler, bringing practical advantages such as the more efficient organization of meetings, data collection and store, the more effective and diversified search for references, the ‘speed’ of the communication tasks or the important function of the ‘backup service’. Among the Italian respondents the benefits stemming from the open Web are mainly indicated in terms of handy advantages, such as “practicality, breadth of coverage”, “fast, efficient, large reach” and “good way to get high impact”. On the other hand, the survey participants included in the UK sample are mainly characterized by a pragmatic and cautious approach, with a focus on getting any immediate reward from selected tools, and a tendency to use self-reflection to plan subsequent, specific steps in shaping one’s own digital engagement.

Table 1: The most mentioned Benefits of the open Web for research purposes

The open Web enhances the research work/environment. The open Web makes the research environment richer, more dynamic and challenging, enabling additional modes for sharing research, but also potentially expanding and improving research findings by facilitating peer review.	The open Web as efficiency-enabler. Expanding possibilities for data collection; organizing data more efficiently with store and back up services; speeding communication and information retrieval.	The open Web improves contacts with co-researchers. Making it more efficient team-work, where teams are inter-institutional or inter-national.
The open Web provides a network amplifier. It is easier to informally contact and interact with experts in a defined fields, even if located worldwide or covering senior positions in academia.	Developing one’s own digital profile. Curating an online academic/professional profile enables the PhD researchers to build own reputation.	

Criticalities

A range of issues emerge from the Italian and UK comments when the participants reflect on their own current digital behaviour and related constraints. For instance, the fear of being overexposed online leads to the decision of not getting “involved in online discussion” and is entangled with privacy issues (e.g. “I prefer to keep personal stuff private”), and the uncertainty about the type of audience one is likely to deal with in online venues. Furthermore, the lack of explicit legitimation is seen as crucial for a wider adoption, along with the steep learning curve implied for an advanced academic use of social networks. In particular, from the UK comments we draw the call for an appropriate negotiation of social media use with one’s own supervisor or tech-savvy academic staff, in order to get some personalized advice to build a social media strategy.

Table 2: The most mentioned Criticalities in the adoption of the open Web for research purposes

Criticalities		
Reliability issues. Multiple sources embed diverse/loosely defined forms of assessment of the published materials.	Privacy/copyright issues. According to research settings/participants, researched individual are to be protected and data/early findings cannot be shared.	Audience issues. Difficult to know role and expertise of users in the open Web/opportunity to reach new kinds of audience.
Legitimation issues. The open Web practices are not still acknowledged in formal academic contexts.	Quality issues. Concerns related to non peer-reviewed materials, but also to a more superficial analytical focus.	Time constraints. Learning to use new tools implies extra work and may cause a risk in terms of attention economy.

Inhibitors

Often across the comments the small size of one's own research team or the space-bounded activities (e.g. "our daily work takes place within the university labs") are mentioned as shaping the continuity of face to face contacts among the co-researchers and thus affecting the use-value of any digitally-mediated communication in the local context. Other respondents suggest a diverse issue of digital redundancy, because the practical needs of doctoral research appear to be already satisfied by a few, 'traditional' tools (e.g. "email/Skype enough") or by well-established channels for scholarly communication. Moreover, the scant diffusion of social media across academic contexts constitutes one of the most mentioned inhibitors. Notably, some sceptical views emerge, stating that 'research work is more complex' and that the tools provided by the open Web are not sophisticated enough to be used for scholarly tasks. On the other hand, among the UK participants personal lack of expertise and individual preferences rather than contextual flaws play a role as main inhibitors in a wider adoption the open Web in their PhD activities. Moreover, always in the UK sample, the institutional library services are said to be sometimes more efficient and reliable than the open Web, for instance in enabling the retrieval of high quality content.

Table 3: The most mentioned Inhibitors in the adoption of the open Web for research purposes

Inhibitors		
Research work is complex / the open Web is easy. Managing a research process requires refined skills to face highly specialized tasks. The open Web appears to be generic and simplistic as a provider of tools for applying research methods.	Current diffusion of individual-based work practices. They are prevalent in – but not exclusive of – liberal arts.	Current prevalence of face-to-face work practices. Research work develops in a defined place, e.g. in a lab, and teams are small-size.
Institutional is better. Existing tools and forms of assistance – provided/suggested by the institution – already efficiently meet the practical needs.	The open Web not yet used. Lack of shared adoption prevents new researchers from using new tools.	Face to face is better. Methodological/critical discussion with supervisors, peers and other experts is thought as more productive and formative when occurring face to face.

Individual perspectives

A variety of general opinions can be highlighted from the comments regarding the value of the open Web for research purposes. A common, pragmatic approach tends to focus on specific PhD activities, such as the construction of an academic profile or a professional one. Diverse contrasting views are in play: for instance, some respondents hold that nowadays the use of the open Web in research work is inescapable and that also reluctant academics are going to adopt it; others maintain a strongly sceptical approach. In this line, the perceived need for downsizing the emphasis put on the open Web, towards a pragmatic approach to social media for research purposes is a view that Italian PhD students share with the UK peers participants in the survey.

Table 4: The most mentioned Individual perspectives toward the open Web for research purposes

Individual perspectives			
The open Web as fostering self-empowerment. Open Web providing the PhD student with diversified venues where drawing new hints from, challenging own assumptions and knowledge, refining one's own research.	Open Web good for supporting specific activities. More quickly learning some research skills, such as dissemination and networking.	The open Web use is likely to increase across academia. Prospective critical mass of academic users, better quality of resources and more expert users.	Perspective of an ancillary use. The open Web seen as a marginal supplement to research infrastructure and conventions, which are currently rich and comprehensive.
Individual agency matters. The open Web tools are key enablers but they are just tools: it is the individual will/engagement which is able to shape learning/research environment and find timely solutions.	The open Web is ordinary stuff in the academic life of a PhD student. Practices and advantages of the open Web for doctoral activities are experienced and assessed.	Irrelevance. Stronger than 'non pertinent' to a defined research area, the judgement of irrelevance is often not explained, but can be coupled to a belief of no potential of the open Web for research activities.	

Discussion: The Goal Orientations of the PhD researchers in the digital

The findings presented in the previous section seem to lead to the statement that social media implies more challenges than benefits to postgraduate students learning to be researchers and self-organizing their digital engagement. Against the hearsay claims on the potential of social software, the newer researchers often find the reality check demanding. As an example, these tools available in the open environments 'promise' to be fast and easy-to-use, whereas the actual time and learning curve needed for reaping any benefits from social networking activities is not affordable and is distracting from the formal doctoral tasks and deadlines. In our analysis, the accounted views can be thought in a continuum. On the one extreme there is the belief that the open Web can enhance the research environment and broaden its boundaries beyond academia, by accelerating and improving the practices of networking and

collaboration, by widening the access to traditional and emergent kinds of scholarly resources. This is said to have implications for the whole community of researchers, but also for the individual apprentice scholar, who has additional ways and venues to practice research skills. On the other extreme, there is the belief that research work is complex and rich of highly specialized tasks, whereas social media tools and environments appears to be generic, simplistic and open to undifferentiated audiences. In the middle, a range of issues are reported, varying from the concerns about copyright issues, alluding to a prevalent competitive approach in some research fields (Harley, Acord, Earl-Novell et al., 2010), to reliability issues addressing the authorship and peer review process of the resources published in the open Web. Building on these early findings, we have attempted to conceptualize the Goal Orientations (Table 5) of the researched PhD students toward the open Web for scholarly purposes.

Table 5: Main Goal Orientations of individual Italian and UK PhD researchers towards the potential of the open Web for research purposes

Pioneering (IT and UK)	Coping (IT and UK)
The aim is attempting an exploratory attitude toward social media for research purposes rather than relying on a mere convenience approach.	The aim is gaining a bespoke and efficient support to occasional, practical needs. It deals with a reactive rather than proactive behaviours.
Waiting for the mainstream (IT)	Rejecting (IT and UK)
A degree of individual engagement is likely to occur whenever specific digital practices become embedded in the academic life of one's own local context. Lack of shared adoption matters.	The open Web is seen as irrelevant to the academic sphere. It does not fit the complexity of the research practices.

The conceptual analysis of the open comments has allowed us to sketch a few clusters of different individual dispositions toward the potential of the open Web: Pioneering, Coping, Waiting for the mainstream and Rejecting. In the 'Pioneering' approach the goal orientation seem to be that of using the open Web tools as spaces for constructing a tentative mode of being scholar, probably as complementary to the model suggested by the local research context. It is worth noting that in the Italian sample the Pioneering approach seems to imply an ideology-driven attitude, in which the individual feels to be part of a collective movement towards not-yet-defined ways of doing and communicating research. Otherwise, in the UK sample we have drawn a peculiar emphasis on the relevance of individual agency for future engagement in the 'digital' as the doctoral journey advances. In the 'Coping' approach the goal orientation is closer to an effort for making sense of a plenty of instruments to get on demand support to current activities. We underscore that in the UK sample a nuance of 'planning' attitude emerges, aiming at shaping a pragmatic 'day-by-day' way for coping with the open Web, as well as for experimenting new digitally-mediated scholarly practices. In 'Waiting for the mainstream' the research participants state to have the adequate flexibility and capacity to apply new practices, but only when they are well-established in their local research community. This disposition however clearly emerges only among the Italian participants, whilst in the UK sample the trustful attitude toward the institutional asset of the doctoral experience is linked to a strong sense of personal responsibility in the endorsement of the new clusters of digital tools and practices. Finally, the 'Rejecting' attitude tends to exclude the open

Web from the academic sphere, because it would not fit the complexity of the research work, that appears to be well served by a range of specialized instruments. This kind of perspective, occasionally shared among Italian and UK participants, indeed seems to shift towards a judgement of ‘irrelevance’ of social media, neglecting the expectations for an evolution of the open web-based technologies to better respond to scholarly needs. It can be argued that whether in the ‘Pioneering’ approach the goal orientation of the PhD students in their self-organized learning ecologies gets close to the goal orientation they endorse in their institution-led learning ecologies, whereas in the ‘Rejecting’ approach the goal orientations are likely to diverge.

Conclusions

To what extent are the PhD students motivated to track complementary or alternative digital routes in their becoming researchers? Building on selected findings drawn from a survey research, this paper has provided a snapshot of motivations and concerns characterizing the digital engagement of individual doctoral candidates. The results drawn from insiders’ voices seem to suggest that the current learning scenarios provided by doctoral programs hardly consider the possible, fruitful relationship between the PhD students’ self-organized forms of assistance and the institution-led research training’s methodologies. The current PhD researchers involved in the study actually struggle in reaping the benefits and face the challenges of the Web 2.0 and social media, only relying on individual enterprise and occasional experiences and aiming to be somewhat supported by the local formal context. Furthermore, the article has proposed a heuristic of their Goal Orientations, mapping the prevalent dispositions toward the digital environments revealed by two non representative samples of Italian and UK doctoral researchers. We are aware that *per se* the suggested line of interpretation of the four Goal Orientations deserves additional investigation to gain insights on the contextual factors (e.g. presence of social media training, adoption of networked practices by the supervisors, etc.) affecting the goal orientations of individual PhD students researching in diverse subject areas and different national settings. In fact, we need to undertake accurate mapping of the assembling activities carried out by newer researchers by combining institution-led and self-organized opportunities in the digital environments. This can help to prefigure new learning scenarios for the PhD students where the use of Web 2.0 tools and social networks in particular can support existing practices as well as unprecedented pilots in knowledge production and distribution.

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EVALUATING WEEKLY PREDICTIONS OF AT-RISK STUDENTS AT THE OPEN UNIVERSITY: RESULTS AND ISSUES

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Introduction

Improving student retention rates is a critical task not only for traditional universities but particularly in distance learning courses, which are in recent years rapidly gaining in popularity. Early indications of potential student failure enable the tutor to provide the student with appropriate assistance, which might improve the student's chances of passing the course. Collated results for a course cohort can also assist course teams to identify problem areas in the educational materials and make improvements for future course presentations.

Recent work at the Open University (OU) has focused on improving student retention by predicting which students are at risk of failing. In this paper we present the models implemented at the OU, evaluate these models on a selected course and discuss the issues of creating the predictive models based on historical data, particularly mapping the content of the current presentation to the previous one. These models were initially tested on two courses and later extended to ten courses.

Problem description

The OU is one of the largest distance learning institutions in Europe, providing several hundred courses to more than 200,000 students. The students primarily receive their study materials online through a Virtual Learning Environment (VLE). Within each course students are split into study groups, typically based on their geographical location. Each study group is supported by a tutor who provides the students with advice, answers their questions, and marks their assessments and exams. In order to support the failing students, the university carries out various types of interventions, involving email, phone calls and face-to-face contact. However, as the resources (staff, time, etc.) available for interventions are limited and the number of students studying a course can reach several thousand, the interventions have to be carefully planned. The key issue is to identify students at risk of failing the course, but who might with additional support still succeed.

Machine learning methods are commonly used to build models for predicting student performance (Romero et al., 2013; Wolff et al., 2014; Huang & Fang, 2013). A typical

approach is to utilise historical data, for example data from the previous presentation of the course, to develop the predictive models, which can then be applied in the current presentation (Wolff et al., 2014; Huang & Fang, 2013). However, this approach is not always as straightforward as it sounds. In cases where the course structure has changed since the previous presentation (e.g. if the number of assessments or their cut-off dates changed), it may be difficult to correctly map the current presentation to the previous one. This might in turn decrease the accuracy of the predictive models.

Related work

A valuable predictor of student success is the results of the student's previous study (Huang & Fang, 2013). However, data from previously studied courses is not available for students who are attending their first courses. These courses are critical, as they determine whether the students will continue their studies. Moreover, retention in these courses is typically low (Wolff et al., 2014). Wladis et al. (2014) define predictive factors using demographic data for estimating student outcomes in online courses. Romero et al. (2013) summarise statistics about the student activity is used to predict student success.

The work presented here builds on the previous research at the OU (Wolff et al., 2014; Wolff & Zdrahal, 2012; Wolff, Zdrahal, Herrmannova & Knoth, 2013; Wolff, Zdrahal, Nikolov & Pantucek, 2013; Hlosta et al., 2014). Initial experiments were undertaken using student activity data from the VLE and their assessment scores (Wolff & Zdrahal, 2012; Wolff, Zdrahal, Nikolov & Pantucek, 2013). The solution presented in this paper combines both the students' demographic data and their activity in the VLE (combined data sources). The prediction is based on votes from four machine learning models. One of the key findings of our previous work was the importance of identifying failing students prior to the first assessment of each course (Wolff et al., 2014). We noticed that students who don't succeed in the first assessment are very likely to fail the whole course.

Data specification

Two types of data are collected: student demographic data and student VLE activity data, which represent individual actions (e.g. participation in forums, learning resources accessed, etc.). Data from the VLE are collected daily. At the OU, the course study plan is structured into weeks (every week, the students are expected to engage with new study materials and tasks). To match the data with the study plan we aggregate the student's activities into weekly summaries. Moreover, as the results of past assessments in the course become available, these are included in the models. Figure 1 shows the OU Analyse Dashboard, which depicts the average online activity during one course together with the average results of the assessment.

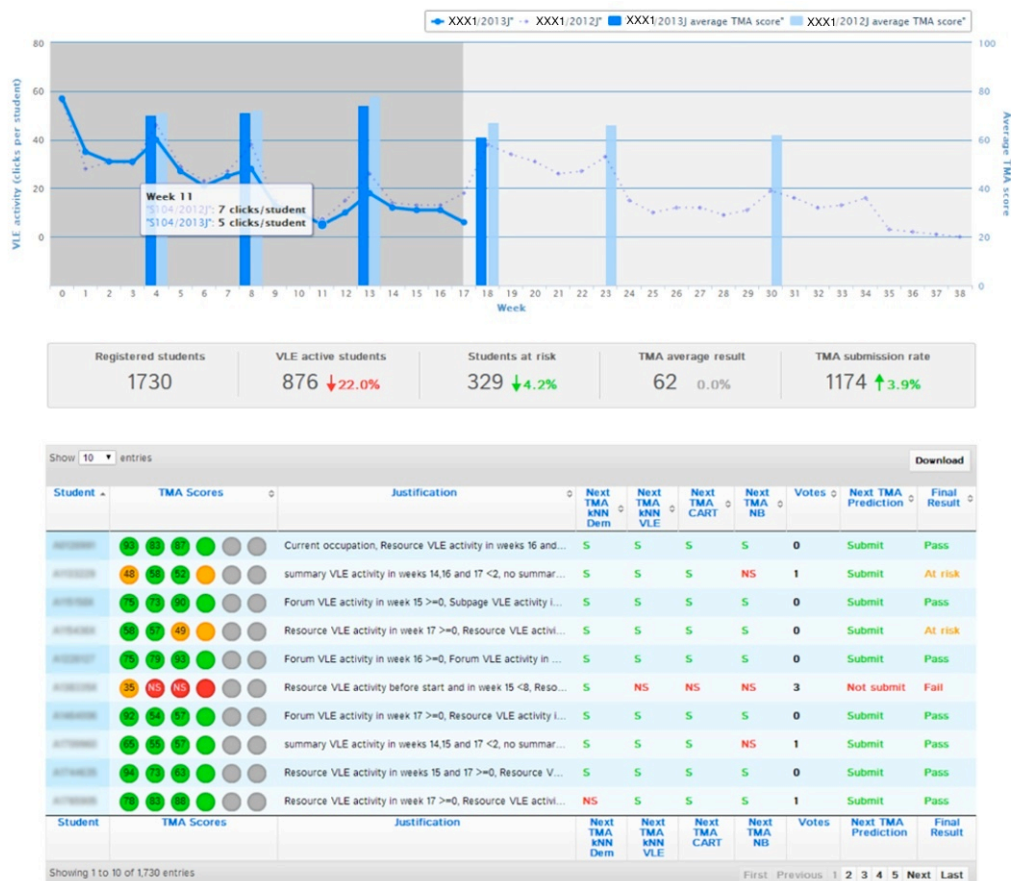


Figure 1. OU Analyse Dashboard showing average daily VLE activity for all weeks a course, course trends and individual student predictions. The bar chart shows the average students' results of the assessments.

Predictive models

Four models are used to predict whether the student will submit the next assessment: Classification and Regression Tree (CART); probabilistic Naïve Bayes model and k-Nearest Neighbours (k-NN), which is run separately using demographic and VLE data. The final verdict is achieved by voting, each model having the same weight. The student is predicted not to submit the assessment or fail if more than two models vote so.

Each model has been selected for its specific properties:

- The Naïve Bayes model makes decisions that are the most probable, making the model average error as small as possible (Duda & Hart, 1973).
- k-NN enables easy identification of the most similar students from previous presentations based on either VLE activity or on demographics. The error of k-NN is at most twice that of the Naïve Bayes model (ibid.).
- The CART method produces an easy to interpret set of rules represented as a decision tree. Moreover, CART works with both numerical and categorical attributes.

These models have been used as the basis for weekly at-risk student predictions for two courses in the summer semester 2014 and ten courses in the winter semester 2014. The predictions are sent every week to the course teams. In addition, all four models were migrated into the OU Analyse dashboard (analyse.kmi.open.ac.uk). The current set of models can be extended by adding new predictive models. The models can also be weighted by their varying importance during the voting process.

Model evaluation

The following section presents the performance evaluation of the four discussed models. The evaluation was done using the current presentation of one of the 10 courses, which we are now analysing. In each week, the goal was to predict if the student will or will not submit the next assessment. At the moment, the selected course has three completed assessments (denoted as A_1 , A_2 and A_3), the last assessment cut-off date is in the 14th week of the course. We used F-measure as the metric for model performance comparison, which is a harmonic mean of the Precision and Recall measures. These are commonly used to compare machine learning algorithm performance. The use of a single measure allows us to easily compare the models.

The results of the evaluation are depicted in Figure 2. The three bold vertical lines represent the cut-off dates of the assessments A_1 , A_2 and A_3 in weeks 4, 8 and 14. The F-measure for the given week relates to the prediction of the result of the following assessment. There are two interesting facts that are worth pointing out.

We can observe steep growth of the F-measure in the first week after both A_1 and A_2 for the demographic k-NN model. In addition to previous demographic features, the data in this week contains information about the results from the previous assessment. In contrast with the demographic attributes, the assessment result is highly discriminative. This can be seen in the first week after each assessment cut-off date when the value of the F-measure of the demographic k-NN rapidly increases.

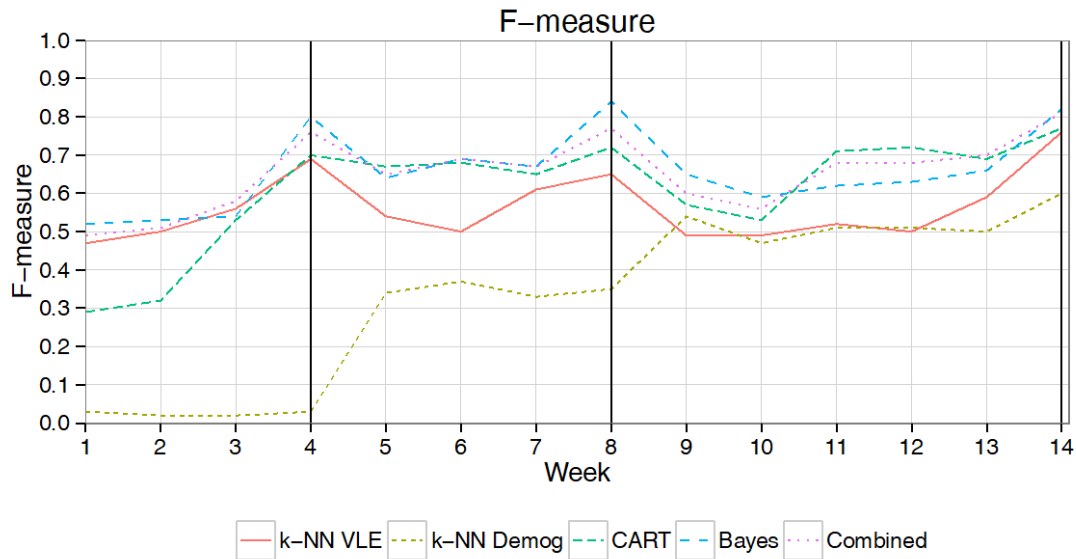


Figure 2. F-measure for the first 14 weeks and 3 assessments of the selected course

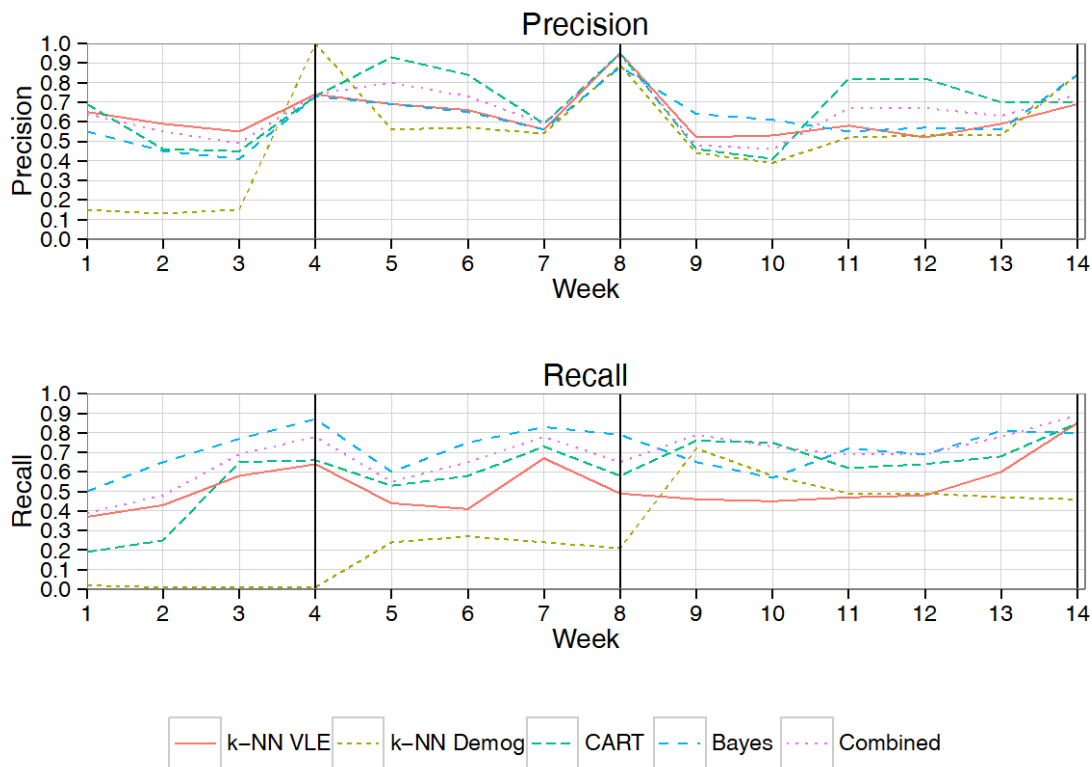


Figure 3. Precision and Recall for the first 14 weeks and 3 assessments of the selected course

Furthermore, the importance of the VLE features (k-NN using VLE data) increases when approaching the cut-off date of the A₁ and decreases in the first week after the assessment. We can conclude that for predicting whether the student will submit the next assessment, it is more important what he/she does right before the assessment rather than at the beginning of

the assessment period. For example, after the assessment the students could take a short rest before focusing on the next one.

Issues

Although the performance of the models expressed by the F-measure looks promising, a more detailed inspection revealed some issues, that are visible after decomposing the F-measure into its components, Precision and Recall, as shown in Figure 3. Although the F-measure increases before the cut-off date as expected, Precision and Recall do not comply with the expected trend (see the drop in weeks 7-8 in Figure 3). This effect is caused by the fact that in the previous presentation (on which the models are trained) the cut-off date for the second assessment was one week earlier than in the current presentation.

Learning predictive models, assessments and prediction errors

We will refer to the previous presentation used for building the models as *model presentation* and to the current presentation in which students' results are predicted as *predicted presentation*. We assume that the structure of the course and the content of the study materials and assessments don't change between presentations, therefore, we can use the previous presentation for training the models. Each presentation has its start date, which can be any day of the calendar week. *Course weeks* are counted from the start date by repeatedly adding 7 days. Presentations typically have around 40 course weeks. Each course week can be associated with specific resources and tasks.

When trying to map the weeks between the model and the prediction presentations, three situations might occur. The ideal situation happens when the cut-off days for assessments coincide with the first day of some course week, and the number of weeks between assessments are the same for the model and predicted presentation, see Figure 4. In this case the predictions that take into account only student activities are not affected by errors due to data mismatch.

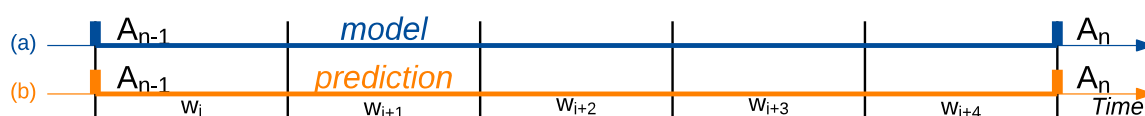


Figure 4. Ideal synchronisation between model and predicted presentations

Unfortunately, the reality is not always that simple. Very often the intervals between the corresponding assessments are not the same. This leads to a mismatch between planned activities in the corresponding weeks of the model and the predicted presentation, which may affect the precision and recall of predictions. If the assessment dates of the model and the predicted presentation differ, we may synchronise the presentations either at the beginning (*forward synchronisation*) or at the end (*backward synchronisation*) of the assessment period.

The models used to generate F-measure, Precision and Recall in Figures 2 and 3 use forward synchronisation (Figure 5), where the model and the predicted presentations are synchronised at the beginning of the assessment period. The period between assessments A_{n-1} and A_n in the

model presentation (Figure 5 (a)) can be shorter (Figure 5 (b)) or longer (Figure 5 (c)) than in the predicted presentation. In this case the data from the last week w_{i+3} before the cut-off date either has to be duplicated (Figure 5 (a) vs. 5 (b)) or merged with week w_{i+2} (Figure 5(a) vs. 5 (c)). In either case we can expect an increase in the prediction error in week w_{i+2} (w_{i+4} respectively). This error would be lower if the key VLE activities important for the assessment were happening at the beginning of the assessment period.

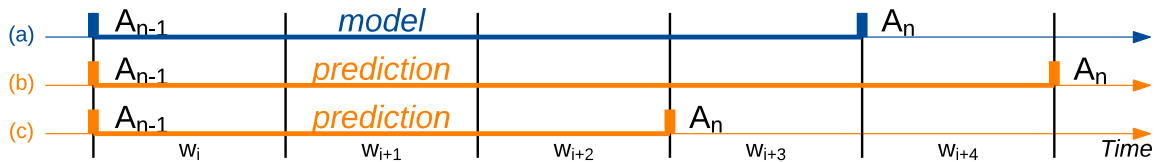


Figure 5. Forward synchronisation of model and predicted presentations

Backward synchronisation (Figure 6) is useful when the majority of students are active in the weeks closer to the cut-off date of the next assessment. There are two possible situations similar to the previous case. The period between assessments A_{n-1} and A_n in the model presentation (Figure 6 (a)) can be shorter (Figure 6 (b)) or longer (Figure 6 (c)) than in the predicted presentation. In this case the data from the first week w_{i+1} at the beginning of the assessment period either has to be merged with week w_{i+2} (Figure 6 (a) vs. 6 (b)) or duplicated (Figure 6 (a) vs. 6 (c)). In both cases we can expect an increase in the prediction error in week w_{i+2} (w_i respectively). On the other hand this strategy is better when students are active in weeks closer to the next assessment (i.e. the most common case of VLE activity).

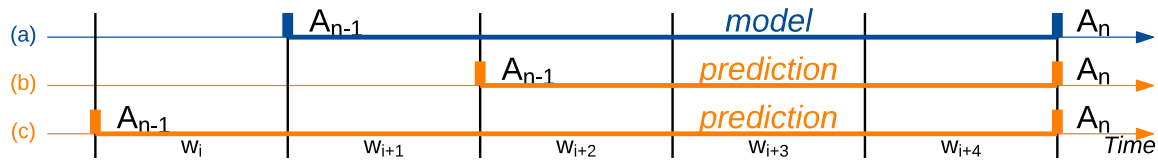


Figure 6. Backward synchronisation of model and predicted presentations

So far, we assumed that for the model and predicted presentations at the beginning (Figure 5) or the end (Figure 6) of the assessment periods were the same (aligned). Moreover, we assumed that the assessment cut-off dates are always at the beginning of a course week. However, this condition is usually not satisfied, the cut-off date can be any day of the calendar week, see Figure 7 (a) (b).

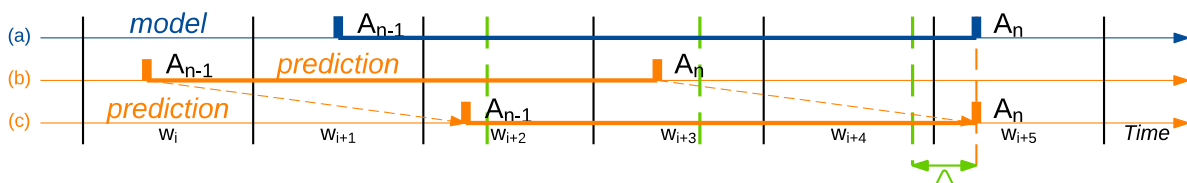


Figure 7. Synchronising model and predicted presentations – general case

This situation can be partially solved using one of the previously mentioned strategies, for example using backward synchronisation (Figure 7 (c)). However, in this case the mapping needs to take into account the fact that cut-off dates can occur on different days of the week.

One possible solution is to introduce new virtual weeks (green dashed lines in Figure 7), which divide the assessment period into selected prediction intervals and which do not need to correspond to course weeks. The solution is then analogous to the previous situation (backward synchronisation).

Predictions of at risk students are important if there is enough time to respond and provide the necessary support, it is too late to predict success or failure at the assessment submission date. Thus one needs to introduce offset period (Δ) before the cut-off date of the assessment (A_n). The assessment period is then divided into the virtual weeks starting from the time ($A_n - \Delta$).

Conclusions

In this paper we presented four machine learning models for predicting students, who are at-risk of failing. We evaluated their performance on a selected course and discussed the issues of learning the models from historical data. We focused on mapping the content of the current presentation to the previous one, as an important factor affecting precision and recall. Although the F-measure increases with the amount of data available for the prediction, due to the selected mapping of the model presentation to the predicted one, Precision and Recall do not comply with this trend. We discussed this issue in more detail and proposed new mapping strategies. The implementation and evaluation of these strategies will be the subject of our further work. All animals present in the testing made it safely home.

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STUDENT VULNERABILITY AND AGENCY IN NETWORKED, DIGITAL LEARNING

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Abstract

The increasing collection, analysis, use and possible sharing of student digital data not only promise to increase the effectiveness of student learning and the effective allocation of institutional resources, but also increase student vulnerability. In the context of the asymmetrical power relationship between higher education institutions and students, students are often seen as data objects with now insight or choice regarding the type of data collected, how the data are stored and used, and opportunities to verify collected data or provide context.

Against the backdrop of Privacy 2.0 and the (in)effectiveness of regulatory frameworks to protect individual data privacy, as well as concerns that thinking in terms of the binary of either opting in or out, we need to critically investigate the collection, analysis and use of student digital data. This paper explores the promise and possible perils of learning analytics through the interpretive lens of student vulnerability. A framework is provided as basis for a student-centred approach to learning analytics where students' agency is valued and optimised within the context of a fiduciary duty of reciprocal care.

Introduction

Amidst vast changes sweeping the higher education landscape, there is an increasing need to use data to increase the effectiveness of teaching and learning, and subsequently, ensure accountability and efficiency in an increasingly resource-constrained and competitive higher education landscape (Altbach et al., 2009). Learning analytics as an emerging discipline and practice promises to contribute to more effective teaching, learning and resource allocation through the collection, analysis and use of student data (Prinsloo & Slade, 2014).

As teaching and learning move progressively online and digital, the amount of student data increases exponentially, opening opportunities for data-informed strategies and pedagogies. Though there is no doubt that the collection, analysis and use of student digital data do offer huge potential, there are also a number of risks and ethical challenges such as the belief that data is neutral; the role of algorithms and the algorithmic turn in higher education; the assumptions and epistemologies informing the collection and analysis and use of data; and the

increasing possibilities for discriminating against already vulnerable and at-risk students (Slade & Prinsloo, 2013; Prinsloo & Slade, 2014).

This paper follows Prinsloo (2014) who proposes that ‘Learning analytics are a structuring device, not neutral, informed by current beliefs about what counts as knowledge and learning, coloured by assumptions about gender/race/class/capital/literacy and in service of and perpetuating existing or new power relations.’ Though the collection, analysis and use of student digital data aims to decrease students’ vulnerability and risks of failing or dropping out, there is also the possibility that in the light of the asymmetrical power relationship between student and institutions of higher learning, students’ vulnerability may actually be exacerbated. As higher education institutions (HEIs) optimise the potential of learning analytics, this paper proposes that institutions should adopt a student-centric approach to learning analytics, empowering students to make informed decisions about the type of data they share, the uses of that data and access to the data collected by higher education.

This paper explores student vulnerability and agency in the context of the phenomenon of Privacy 2.0.

Privacy 2.0

Central to an investigation of student vulnerability and agency in digital and networked learning is the notion of privacy. Whilst privacy has traditionally been understood to encompass the ‘right to be left alone’ as well as having sufficient control to restrict unauthorised access to personal information (Xu, 2011), Solove (2006) cites BeVier who suggests that ‘privacy is a chameleon-like word, used denotatively to designate a wide range of wildly disparate interests – from confidentiality of personal information to reproductive autonomy’ (p.479). Solove (2006) and others therefore state that the notion of privacy is in disarray and increasingly fluid frustrating efforts to define it and to develop regulatory frameworks that safeguard it. Xu (2011) states that in the context of online social networks, conceptualisations of privacy ‘have been somewhat patchy’ (p.1100). Contrary to the belief that the notion of privacy entails a ‘unitary concepts with a uniform value, which is unvarying across different situations’ (Solove, 2006, p.480), we should see privacy as a ‘multifaceted concept’ (Xu, 2011, p.1079) and pluralistic. Xu (2011) helpfully proposes that neither ‘privacy as control’ nor ‘privacy as restricted access’ (p.1080) are sufficient to encompass the complexities and layers inherent in privacy (Pasquale, 2012, 2015). The asymmetrical power relationship is further embedded given that Terms and Conditions are typically ‘drafted by one party and offered to the other on a take-it-or-leave-it basis’ (NYU, 2015, par.1). Solove (2004) therefore proposes that most ‘discussions of privacy merely scratch the surface’ and that we need ‘a better understanding of the problems; we must learn how they developed, how they are connected, what precisely they threaten, and how they can be solved’ (p.6). Our definitions, as well as our legal and regulatory frameworks often struggle to keep up with technological developments and changing societal norms (Westin, 2003). HEIs have been caught un(der)prepared by, on the one hand, optimising the collection and analysis of student data, and on the other hand, protecting student privacy (Prinsloo & Slade, 2013).

Student vulnerability as lens

To be vulnerable is ‘to be fragile, to be susceptible to wounding and to suffering; this susceptibility is an ontological condition of our humanity’ (Mackenzie et al., 2014, p.4). Despite and amidst the asymmetrical power relationship between students and institutions of higher learning, Prinsloo and Slade (2015) state that it is important to note that vulnerability refers not only to the exposure to risk of individuals but also broader society - see, for example, Bauman (2007) and institutions of higher learning (Altbach, Reisberg & Rumbley, 2009).

Though this paper specifically focuses on student vulnerability in the context of online and networked learning, we should also recognise that the higher education landscape is changing substantially, resulting in increasing resource constraints, competitiveness, and the need to optimise the collection and use of data in order to plan more effectively (Prinsloo & Slade, 2014).

Baker and Siemens (2014) point to the potential of learning analytics made possible due to increasing quantities of data, standardised formats of educational data, increased computational power and the availability of a range of analytical tools. As a result students are increasingly exposed and vulnerable as they study online and are confronted by the all-pervasive gaze of the institution. Prinsloo and Slade (2015) state that, though the intention of collecting and using student data arguably falls within the scope of the fiduciary duty of higher education, it is increasingly possible that student data also be used inappropriately and unethically, further increasing the vulnerability of students. Like the notion of privacy, the notion of vulnerability is ‘undertheorised’ (Mackenzie et al., 2014, p.2). Current theoretical thinking suggests that vulnerability is not only a key characteristic of human life, but a defining characteristic. This does not preclude the fact that certain individuals and groups are ‘more than ordinarily vulnerable’ (Sellman quoted by Mackenzie et al., 2014, p.2) (Also see Fineman, 2008; Maringe & Singh, 2014; Trowler, 2014).

In this paper we use the notion of vulnerability as ontological lens that ‘stresses the ways that inequalities of power, dependency, capacity, or need render some agents vulnerable to harm or exploitation by others’ (Mackenzie et al., 2014, p.6). This is of particular concern in the context of learning analytics.

A brief overview of some current approaches to addressing online vulnerability and agency

Xu (2011) warns that most current approaches focus on individual agency but, given that individuals’ information may be accessed due to ignorance of privacy and security of others, we should take a different approach when discussing individual agency. ‘Optimistic bias’ impacts both on the steps which individuals take to control the disclosure and access to their personal information and ‘the degree of ease with which [users’] online profiles and their personal information are visible and exposed to others’ (p.1083). Though we would assume that individuals make rational decisions regarding the sharing and protection of their

information, it is safer and possibly more realistic to speak about a 'bounded rationality'. That is, 'individuals may genuinely want to protect their information privacy, but ... may opt for immediate benefits of information disclosure, rather than carefully calculating long-term risks of information disclosure' (p.1088). Clearly there is a difference between acknowledging risks to personal privacy and acting on them.

A number of authors (e.g., Acharya & Gorman, 2013; Antón & Earp, 2004; Bellman et al., 2001; Earp et al., 2005; Pasquale, 2012; Prinsloo & Slade, 2015) point to the failures of providing opting in or out as sufficient to protect against online vulnerability. For example, research done by Bellman et al. (2001) points to a variety of aspects that might impact on individuals' decision to opt in or out, such as the default settings of the choice, the typeface and font size used, the length and technical complexity of the Terms and Conditions (TOC), and the framing of the options.

Miyazaki and Fernandez (2000) provide a much needed, rich and nuanced presentation of a range of options regarding the collection, analysis, use and sharing of personal information in the context of e-commerce. Possibilities of disclosure range from i) never collecting data or identifying customers when they access a site; ii) customers opting in by explicitly agreeing to having their data collected, used and shared; iii) customers explicitly opting out; iv) the constant collection of data without consumers having a choice (but with their knowledge); and v) the collection, use and sharing of personal data without the user's knowledge. Prinsloo and Slade (2015) refer to the Organisation for Economic Cooperation and Development's position that 'prior affirmative consent in all cases would be impractical' and it can be assumed that should users be required to set up an account to use the services, they implicitly agree to the terms and conditions. Ohm (2015) notes that once data has been legitimately acquired, current legal frameworks do not dictate of the scope and constraints regarding the use of such data. There is therefore a need for a 'new deal on data' (Greenwood et al., 2015, p.192). Though Greenwood et al. (2015) specifically refer to changes needed in the regulatory frameworks governing the collection, use and sharing of data, these frameworks are but one part of the bigger strategy to address individual digital vulnerability.

Xu (2011), for example, provides a very helpful framework with regard to privacy management distinguishing between personal control, collective control and proxy control. Personal or individual privacy management involves both behavioural self-protection and technological self-protection. With regard to the latter, Acharya and Gorman (2013) provide a very helpful overview and review of tools such as Ghostery and BetterPrivacy, and a variety of encryption services.

Collective privacy management refers to a group accepting the responsibility for co-responsibility of privacy and addressing risk. Though individuals may make informed decisions regarding what they share on which platforms, it may not be the case that others sharing that information will take the same amount of care – e.g., the practice of 'tagging' and 'untagging.' Sharing practices on Facebook, for example, highlight the 'complexities of collective privacy management, the tensions of content ownership, and the effects that one

user uploading and tagging a picture of another can have on the latter's relationships with friends, family, employers, etc' (Xu, 2011, p.1093). (See Xu, 2011 for a discussion on privacy-enhancing technologies for collective privacy control). Proxy privacy control refers to the practice of individuals and groups who align themselves to 'a powerful force in order to gain control through powerful others' in recognition that individuals and groups often lack skills or knowledge in protecting information privacy (Xu & Teo in Xu, 2011, p.1095). Proxy privacy management includes, but is not limited to, industry self-regulation and government regulation. An interesting development in proxy privacy management is the development of accreditation authorities such as TRUSTe, BBBOnline and Webtrust who will verify an organisation's privacy management TOC and their adherence to it (Antón & Earp, 2004).

Towards a framework of student agency

Prinsloo & Slade (2015) suggest a framework to mitigate student vulnerability and optimise student agency. The framework includes

1. the duty of reciprocal care;
2. the contextual integrity of privacy and data;
3. the centrality of student agency and privacy self-management;
4. the need to rethink consent and employing nudges;
5. developing partial privacy self-management;
6. adjusting privacy's timing and focus; and
7. moving toward substance over neutrality and moving from quantified selves to qualified selves.

Though HEIs have the right to collect, analyse, use and share data within the scope of their mandate, learning analytics should also be located within the ambit of the fiduciary duty of the providers. Though the balance of power lies with the providing institution, students are not mere data objects but can (and should) participate in the collection, analysis and the verification of data. Prinsloo & Slade (2015) therefore suggest that educational providers 'make their TOCs as accessible and understandable as possible' making clear 'what data is collected, for what purposes, and with whom the data may be shared (and under what conditions).' It is also suggested that, where feasible, institutions make data sets available to students 'to verify or correct conclusions drawn, where necessary, as well as provide context, if appropriate.' From a procedural perspective, this might necessitate the appointment of a neutral ombudsperson to address concerns and issues flowing from the contract between institution and students. The fact that the collection of student data takes place within an asymmetrical power relationship does not exempt students from a responsibility to ensure that their data is correct and current. As already acknowledged, since data and algorithms are not neutral but are embedded in ontological and epistemological positions and assumptions, it is crucial that the contextual integrity of data and especially historical data is recorded, open for scrutiny and preserved. As historical data are increasingly aggregated and re-used in

contexts and for purposes different from the original context and purpose in which the data was collected, it is necessary to prevent contextual integrity collapse.

There are many approaches to education but if education is seen as moral practice (Slade & Prinsloo, 2013) and given the asymmetrical power relationship between students and institution, we need to critically explore the range of student control over what data will be analysed, for what purposes, and how students will have access to verify, correct or supply additional information. If students are rightly seen as agents and active collaborators in the harvesting, analysis and use of their data, HEIs must find ways to engage students not only in policy formulation but also in assuming responsibility for verifying information and analyses and in contributing information that can result in a better, mutual understanding of students' learning journeys (Kruse & Ponsajapan, 2012). As Prinsloo & Slade (2015) state, 'it is no longer acceptable to assume as default a position where students must accept that registration equates to forfeit of control over their data.'

Table 2: Privacy policy taxonomy: Privacy protection and vulnerability goals (adapted from Earp et al., 2005)

Privacy protection goal classification	Privacy vulnerability goal classification
Notice/Awareness – informing students regarding the type of data collected, timing of collection, protection and storage, sharing of data.	Information monitoring – students should be informed regarding not only the scope and use of data collected, but also methods of collection, e.g. cookies, whether the data will be re-shared and with whom, etc.
Choice/Consent – the range of available options goes beyond the simple binary of opting in or out. Institutions must explore various possibilities to enlarge students' participation and awareness.	Information aggregation – historical data is increasingly combined with recent or current data to provide more complete user digital profiles. Students should be informed regarding the extent and impact of aggregation as well as steps to prevent the re-identification or re-personalisation of aggregated data.
Access/Participation – though the collection of most student data takes place behind institutional firewalls, HEIs should investigate the various layers of access and/or participation with various levels of exposure and collection of data. Though Earp et al (2005) only flag the possibility of opting in or out, we suggest that students should also be provided access to data to ensure its accuracy and, where necessary, provide additional information to ensure contextual integrity.	Information storage – refers to what data is stored, the governance of data and access control.
Integrity/Security – students should be provided with the assurance that the data collected will be kept secure and not shared without prior consent.	Information transfer – students have a right to know what type of data will be shared with whom, and under which circumstances.
Enforcement/Redress – not only should students be held responsible for ensuring the accuracy of information, but they should be held accountable where fellow-student information is shared outside the institution's regulatory/policy environment.	Information collection – students need to be informed regarding the scope, type, use, methods and timing of data collection – whether by targeted collection through, e.g., surveys, or by collecting browser information, IP addresses, etc.
	Information personalisation – the mere personalisation of a user's experience when accessing a web site (e.g., 'Welcome back Paul') points to the nature of data collected and used. Students should be informed and where possible, provide consent to the personalisation of services.
	Contact – How and for what purposes may students be contacted and by whom?

The framework used by Antón & Earp (2004) and Earp et al. (2005) offers a useful starting point by providing a number of ways in which HEIs might optimise student participation whilst reducing the level and experiences of vulnerability and risk. The two central elements of the framework are ‘privacy protection goal classification’ and ‘privacy vulnerability goal classification’ (see Table 1 for an overview). For each element of the framework, it is crucial to fully consider the reciprocal aspects of care and responsibility in order to address various nuances of vulnerability, but also to mitigate against any potential impact on student vulnerability which might result from the asymmetrical power relationship.

(In)conclusions

In line with a student centred approach to learning analytics (Kruse & Pongsajapan, 2012), the renewed emphasis that learning analytics is about learning (Gašević, Dawson & Siemens, 2014) and embracing the agency of students will allow students and HEIs to move from seeing students as data objects or students seeing themselves as quantified selves but rather as qualified selves (Davies, 2013; Lupton, 2014a, 2014b). Through the quantification practices in higher education, students’ vulnerability is increased when they see themselves, their potential and their futures, as presented in the number of clicks, logins, time-on-task. We are more than our data (Carney, 2013). ‘Where the quantified self gives us the raw numbers, the qualified self completes our understanding of those numbers’ (Carney, 2013, par.8). Our students are therefore much more than just conglomerates of quantifiable data and it is important that we take into account ‘the contexts in which numbers are created’ (Lupton, 2014b, p.6).

‘Just as stories yield data, data yield stories. And just as it is difficult to quantify our lives without data, we cannot qualify them without context or narrative. When we bring the two sides together, we achieve deeper self-knowledge’ (Boam & Webb, 2014, par. 21).

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STEMMING THE FLOW: IMPROVING RETENTION FOR DISTANCE LEARNING STUDENTS

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Abstract

Though concern about student attrition and failure is not a new phenomenon, higher education institutions (HEIs) have struggled to significantly reduce the revolving door syndrome. Open distance learning higher education is particularly susceptible to high student attrition. Despite a great deal of research into the student journey and factors impacting on likely success, we are not necessarily closer to understanding and being able to mitigate against student attrition. Learning analytics as emerging discipline and practice promises to help penetrate the fog.

This case study describes work undertaken at the Open University in the UK to investigate how a learning analytics approach allows the University to provide timely and appropriate student support in a cost-effective manner. It includes a summary of the establishment of curriculum-based student support teams and a framework which defines more standardised student support informed by both student data and an enhanced knowledge of the curriculum. The primary aim of student support teams is to proactively support students through their study journey and to optimise their chances of reaching their declared study goals.

Higher education institutions (HEIs) are making increasing use of learning analytics to support delivery of timely and relevant student support. The Open University in the UK, like other HEIs, knows a great deal about its students before they start to study and is able to track student behaviours once study has begun. Until recently, the university has not taken full advantage of the additional insight offered by such information. This paper describes the framework of support interventions established for all student support teams and describes the learning analytics approach used to support that framework.

Background

It is difficult to understate the scope and impact of the changes facing higher education. Terms such as “disruption” and “innovation” (Christensen, 2008), “disaggregation” (Wiley & Hilton III, 2009), the “unbundling and unmooring” (Watters, 2012), “revolution” (Altbach, Reisberg & Rumbley, 2009), and “crisis” (Carr, 2012) have become endemic to discourses on

the current and future states of higher education. Distance, open and e-learning are particularly vulnerable to concerns around quality and student retention (Gaskell & Mills, 2015) despite and amidst claims that higher student attrition in distance education is ‘normal’ and that we should not pathologise this phenomenon (Woodley, 2004). Considering higher education as moral practice, we cannot shy away from the cost of student attrition, to students and institutions alike (Prinsloo & Slade, 2014).

Within this climate, there are claims that student data has become ‘the new black’ (Booth, 2012) and that collecting, analysing and using student data will be a game changer (Diaz & Brown, 2012). Baker and Siemens (2014) point to the potential of learning analytics made possible due to the increasing quantities of data, standardised formats of educational data, increased computational power and the increased availability of a range of analytical tools.

The Open University in the UK (UKOU) supports almost 200,000 distance learning students each year across a range of over 600 undergraduate, postgraduate and professional modules making up a range of qualifications. Teaching is delivered through module materials and on-module academic support from a tutor and/or faculty staff (see Simpson, 2013; Tait, 2012).

Students receive module materials in electronic and/or hard copy and are typically supported, at a distance, through each module by their tutor, working in groups of around 20 students. Tutors facilitate students’ learning and understanding through a variety of approaches: for example, at occasional, optional local tutorials, through assignment marking, interaction and discussion via online tutor group forums, as well as through personal email and phone contact where needed.

Drivers for change

In addition to the impacts of general changes affecting higher education, open distance learning (ODL) institutions are particularly affected by changes in funding regimes in the context of their student profiles, admission requirements, costs, and need for effective student support (e.g., Subotzky & Prinsloo, 2011). At the scale at which UKOU operates, student recruitment is a resource intensive activity. Over time, the size and complexity of the support model led to a number of localised approaches and growing inconsistencies in service and support delivery. Understandably, for reasons of both cost and student benefit, a priority has been to maximise the retention and progression of its students.

Following a significant review and pilot period (Open University, 2011), the University established a new model of curriculum-led support which would provide integrated learning and teaching in order to:

- enhance the student experience;
- be flexible and adaptable in responding to changes in student needs and the University’s environment;
- be cost-effective for students and the University; and
- improve module completion and progression onto further study.

This paper discusses the framework of consistent support established across all SSTs and the use of learning analytics to inform and facilitate that support. The framework recognises many of the issues mentioned in the review of Beetham et al. (2009), for example, that there needs to be recognition of the diversity of learners and the need to support learners in developing study practices which are based on technology, particularly at key 'transition points' of study.

A targeted approach to student support

Since early 2014, students have been supported by a primary student support team (SST) based in one of 12 regional or national centres in the UK (Open University, 2014a). Students are automatically allocated to an SST at registration based on their primary curriculum area. Qualifications and modules are uniquely associated with an SST, with almost all on-study (non-academic) support provided by the relevant SST. Each SST has interventions closely aligned to its curriculum and to the profile of its students. The SST aims to pre-empt and guide student behaviour and to rapidly respond to situations where students are not engaging as expected. Each qualification within an SST's curriculum area (and each module within each qualification) has a number of defined milestones which have been agreed to be key or at least facilitative to the students' eventual completion and success.

Student support teams combine milestone tracking with additional information generated by module tutors and students to trigger interventions aimed at encouraging the student and to keep them on track. As students study, pause between modules, or consider which module to study next, support and advice is consistently provided by the same team accessed via a single set of contact details.

The team's challenge has been to provide student support which is personalised to students' different needs – but at scale. The approach to student support described below can be summarised as 'inform all, target advice, guide the individual'. Interventions begin one-to-many, are then narrowed down to selected cohorts of students and end with individual guidance for a few. In this respect, learning analytics seems to provide a very effective approach to optimise the collection and analysis of student data in order to personalise support at scale.

A Model of Integrated Learning and Learner Support (MILLS)

An enhanced model of support was developed which integrates both learning and learner support into a single framework. This is known within the UKOU as the Model for Integrated Learning and Learner Support (MILLS) and defines both the principles and practices for each SST's student support interventions and provides a consistent framework within which all SSTs operate.

Students are classified as students in three senses: as students of the University, as students aiming for a qualification and/or as students studying a module. MILLS is designed to incorporate support interventions which are explicitly associated with each of these aspects of

studentship. Support interventions are designed to take cognisance of the relevant stage of the student journey with the recognition that more focus may be required at particular stages than others.

An overview of the model and links to tracking data

The MILLS framework comprises a set of prescribed 8 modules (M) and 4 qualifications (Q) focused Universal Interventions which **all** SSTs apply as appropriate to students within their curriculum area across the student journey. These Universal Interventions cover both the learner *and* their learning whilst studying a qualification and/or a module. Whilst the interventions are applied to each module or qualification, the selection of appropriate students in receipt of an intervention is conditional on their personal data or study behaviour (or a combination of both). The interventions can be generic and unmodified or tailored to include qualification or module-specific content. For example, a generic 'getting started' e-message sent to all students one week after module start may be tailored depending on where the student is located, their stage on their qualification journey, whether they are an undergraduate or a postgraduate student and which qualification or module they are studying.

Universal Interventions are driven *by tracking student data* within an SST and can be delivered via telephone, e-message, or email, although the scale of the intervention exercise has necessarily resulted in email as a default mode.

In addition, reactive learner support interventions are driven by direct student and/or tutor contact and are therefore personalised for the individual student. They can be elicited in response to an intervention from the SST (for example, students responding to an e-message regarding their preparedness for an end-of-module assessment) or they may be spontaneously generated by students at any point in their student journey, for example, a student contact around changing study intentions or to appeal against an assignment score.

As well as Universal Interventions, an SST is able to apply Elective learning and learner support interventions to meet the needs of specific curriculum areas, subject to resource availability.

Both Universal and Elective Interventions may be targeted to particular subsets of students. For example, although each SST would be expected to provide a universal welcome to all students, they may wish to define and select some students according to very specific criteria. Thus, SSTs with modules or qualifications with a significant work-based component may define all students not in current employment as potentially at greater risk of non completion, whereas those on a maths qualification may choose to define all those who have not attempted a maths diagnostic and who have a low Previous Educational Qualification (PEQ) as at potential risk.

In developing MILLS for a specific SST, teams were thus given a clear framework of those interventions, described below in Table 1, which relate to the whole student journey, coupled

with sufficient flexibility to allow the framework to be tailored as appropriate to their learning strategy and student profile.

Table 1: A summary of the key module (M) and qualification (Q) interventions

	Intervention	Description
M1	Post-registration, pre-module start	This intervention welcomes the student to the University. It provides information on the role of the Student Support Team (SST), refers them to their induction site and the associated online forum to 'start your induction now'. Gives students the module start date.
Q1	Study Intentions	Certain students will be contacted for general advice on study intensity (workload) and appropriate study pathways before module start.
M2	Students deemed potentially at risk	Contact is used to welcome the student to their SST, explore issues around preparing to study, signpost online resources including the induction website and qualifications online. Students will be selected wherever possible based upon prior knowledge of retention characteristics known to be relevant to that curriculum area.
M3	'Getting off to a good start'	Generic advice within the first week on how to get off to a good start, where to find online support, advice on starting first assignment, when to contact the Student Support Team.
M4	'Keeping up with your studies'	SSTs to select an early module task, possibly submission of the first assignment or engagement in a module forum activity, and contact all students who fail to submit/engage, urging them to contact their tutor/SST.
M5	'Reviewing your progress'	Contact to encourage reflection on study progress as a mid-module progress check. Students signposted to relevant web resources and encouraged to contact the SST for advice as needed.
Q2	'Your next module'	Contact to encourage reflection on choice of next module within their qualification (where applicable) or to consider their choice of qualification and how this might link in with career aspirations, as well as to encourage completion of personal development plans. Signposts for additional advice and guidance if required, and how to register, etc.
M6	'Meeting the challenge'	Contact to encourage reflection on study progress in the final third of the module, to think about study choices and who to contact if there are concerns about progress.
M7	End-of-module assessment	Advice and support for preparing for an exam or final written assessment, including signposts to resources for revision, academic writing, past exam papers and managing stress – plus advice on practical arrangements, including rules on resit/resubmission and postponement.
Q3	Next steps	Contact to encourage students to reflect on their progression within their qualification and to plan ahead in terms of study intensity, career and study goals.
M8	Resit/resubmission advice	Preparation support to all students eligible for resit/resubmission.
Q4	Qualification completion	Contact to congratulate student, explain the benefits of becoming an alumnus (including the extended careers service), signpost to details of graduation and further study possibilities.

Learning analytics to support retention

Learning analytics is already a key part of the approach within the UKOU to proactively support students in achieving their declared study goals. The term intervention is being used in a broad sense to reflect the complexity and diversity of learning and teaching. In the UKOU context, this could for example imply a range of potentially combined interventions, such as re-versioning learning materials; posting a message to a whole cohort via an online noticeboard; targeting a specific category of students with relevant support; and changing a

module or qualification's assessment strategy as a result of an improved understanding of student engagement or known problems.

At the simplest level, the University uses student data to target and deliver the MILLS interventions to whole or partial groups of students. This approach focuses on students already registered on a module or qualification and is largely based on tracking student progression against pre-defined milestones (learner focus). In addition, analytics is helping to review curriculum design (learning focus) and there are a number of ongoing projects which are using or piloting other approaches with the aim of systematically improving student retention and progression.

Data visualisation

As learning analytics becomes more embedded within business as usual, it will be crucial that staff are both equipped to access data in a simple and meaningful way, and have the requisite skills and understanding to interpret raw and combined data as well as any derived information. An approach is underway to put in place data visualisation software which will allow relevant staff to view and drill down into information. This will provide access to a suite of visual data reports and tools that provide an 'in-flight' view of the progress and status of the student body, as well as providing visual data reports and tools that enable SSTs and module and qualification teams to evaluate their interventions.

Predictive modelling

Work has been underway for some time on a set of predictive models which have the potential to identify a range of possible future outcomes at individual student or module level. This approach allows for the establishment of interventions designed to prevent or minimise events that are shown to impact on attrition rates. One approach, developed initially for income forecasting, performs a statistical analysis on historical data. When applied to current students, the model provides predictions of the likelihood of each student reaching a series of future milestones. This model uses demographic and previous study history data and has potential use for SSTs wanting to employ a more rigorous approach to identifying students at potential future risk of non completion, say. A second approach combines a historical analysis of previous study behaviours (typically online engagement) and assignment submission rates to the behaviours of current students on a module and predicts the likelihood of passive withdrawal. This approach has been piloted on a number of level 1 modules and seems to provide a reliable indication of students at risk of non submission of future work and thus of non completion.

The University is aware of the need to avoid wholesale reliance on predictive models, recognising that students are individuals rather than a reflection of their data (Prinsloo & Slade, 2015). There is also recognition of the need to avoid unnecessary or permanent labelling of individuals. Whilst the adoption of such models provides a capability to assess the risk of non completion at scale, it is understood that interventions based on predictions alone require some aspect of human interpretation. Having said that, it is hoped that such models

will enable the deployment of a useful predictive indicator of student persistence that can be used to trigger timely and relevant interventions. In response to concerns regarding the use of data to determine student support, the UKOU introduced a policy which specifically addresses the ethical use of learning analytics (Open University, 2014b). It is considered to be the first HEI to introduce such a policy.

Small data student tools

The Student Tools pilot is exploring whether making analytical tools available to students will support them in making informed study choices. This pilot is investigating the value of using data captured during the pre-study phase of the student journey in creating insight into student retention and is currently developing prototype tools which enable students to self-serve analytics outputs to impact their motivation and inform their study choices.

Intervention and evaluation

Any system which sets out to improve student retention and progression rates should be coupled with an appropriately rigorous evaluation process. An evaluation workstream has been established which provides an academically sound approach to identifying, making and evaluating the success of evidence-based interventions at the curriculum, module and individual student level. This will allow SSTs, as well as module and qualification teams, to evaluate the effectiveness of interventions for review and improvement purposes. As well as supporting students already registered with the University, the increased understanding of the factors impacting student success will also be shared with the marketing and registration teams to inform interventions made during the enquirer journey.

The impact of learning analytics on student retention

Longer term retention in distance learning institutions can be problematic to track and control (Subotzky & Prinsloo, 2011; Woodley, 2004), and a learning analytics approach would be useful in better understanding student patterns of drift between modules. However, as other studies have found (Clow, 2013), it is very difficult to directly attribute any changes in retention and completion data to a set of interventions triggered by learning analytics. The UKOU piloted the Student Support Team approach between 2009 and 2012 in seven different curriculum areas. Each pilot team developed a set of interventions based on their understanding of the needs of students within their subject areas and used student demographic and study data. The outcome was not necessarily improved retention and completion across the piece, but an increased understanding of the types of interventions that might prove effective as well as an improved appreciation of the resource requirements and constraints for planning and implementing specific interventions. This pilot work led directly to the establishment of the current Student Support Teams and influenced the core framework of universal interventions known as MILLS.

Further work is clearly needed on several fronts. The University will continue to work toward an improved understanding of how to reliably evaluate the effectiveness and impact of learning and learner interventions. It is crucial that we are able to assess where best to invest

intervention resource – any intervention, even if automated, will trigger further response and engagement from the student. At a time when resources are finite and increasingly stretched, decisions must be made about where resource will be placed and which activities must stop. Analytics provides enormous potential in support of more impactful retention strategies, but must be well understood before it can be universally embraced and implemented. Alongside this, there is a need to ensure that all those who are required engage in interpretation of student data have the skills and understanding needed. Further staff development is key to this and should not be underplayed. Finally, the voice of the student is key – the UKOU is committed to its mission as an Open University, consulting its students on the uses of their data as the role of learning analytics is further explored.

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CONTRIBUTION OF NORMATIVE STAKEHOLDER THEORY TO AN EDUCATIONAL DATA WAREHOUSING PROJECT

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Abstract

With exponentially growing data quantity, the importance of succeeding in educational data warehousing implementation significantly increased. High level of system quality is more associated with succeeding in organizational- and project implementation than in technical implementation, therefore this thesis aims to find a way to improve factors affecting organizational- and project implementation success. Majority of them is strongly people-related, but still there is a gap in literature on how these factors should be improved. Many researchers in the discipline of stakeholder theory are engaged with stakeholder identification and classification. This research investigates how normative stakeholder theory can contribute to the improvement of these people-related factors by conducting an exploratory case study. Stakeholders of a learning analytics project at the University of Amsterdam are identified and classified in accordance with a significant classification model, furthermore, presence of the previously defined factors is measured within the project. As a result, this paper provides several recommendations on the improvement of these factors by linking them with the identified and classified stakeholder groups.

Introduction

As quantity of data exponentially increased in the last decades, collecting data manually from several sources was more time-consuming and the chance for errors became relatively big. Furthermore, data had to be 'cleaned up' before analysis and new policy implementations into databases were often impossible (Hoekstra, 2014). Therefore the importance of data warehousing (DW) projects noticeably increased in the last couple of years (Rome, 2004; Cuzzocrea & Dayal, 2011). Ineffective stakeholder management can easily lead to mistakes, delays and misinterpretation or misunderstanding of information, which can have crucial consequences, even the failure of the project (Nelson, 2007; Cerpa & Verner, 2009). Many scholars in the discipline of stakeholder theory highlighted the significance of identifying, classifying, involving and engaging stakeholders and their claims (e.g. Mitchell et al., 1997; Agle et al., 1999; Espinosa-Orias & Sharratt, 2011; Parent & Deephouse, 2007). Most of the literature examines the previously mentioned issues in an organizational environment. But what happens if stakeholder identification and classification are examined the context of an educational data warehousing project? How could stakeholder theory help in a better understanding of DW implementation success?

There are several factors in the data warehousing literature that are proved to influence data warehousing success, substantial part of them can be closely related to the management of stakeholders, for instance adequate user participation, proper management support, high level of team skills etc. (Wixom & Watson, 2001; Shin, 2001; Yeoh & Koronios, 2010). Using Mitchell et al.'s (1997) normative stakeholder theory as the backbone of the theoretical framework, stakeholder groups can be identified and classified by assigning the attributes of power, legitimacy and urgency to them. This way, better identification and positioning of stakeholder groups are assumed to help improving the factors affecting DW organizational- and project implementation success. In this research, the following questions are aimed to be answered: *Who are the potential stakeholders in the project? How are stakeholder groups classified in the project?* To do so, an exploratory case study is conducted by examining the UvAInform Learning Analytics project at the University of Amsterdam (UvA).

Learning Analytics and the UvAInform Project

There are many ways of exploiting the advantages of educational data warehousing, but analyzing individual behaviour is one of the most profitable options, especially in the fields of sales and marketing (Wixom & Watson, 2001). Considering the same principle in the world of education, there are lots of opportunities in tracking and analyzing individual student behaviour and performance during the whole period of studying. Learning Analytics (LA) collects, measures, analyzes and reports findings on the basis of “digital breadcrumbs” that learners leave in different computer systems with the main purpose of comparing and predicting student performance, discovering social interactions and optimizing learning outcomes and learning environments (Educause, 2011; SOLAR, 2010).

In this research, the UvAInform Learning Analytics project is examined. The objective of UvAInform is to deliver a community sourced, secure, scalable repository for the use of learning analytics within the UvA. Learning Record Store (LRS) subproject is focusing on building a repository of student activity. The LRS will reliably store and retrieve data from Blackboard, Student Information System, MijnUvA and potentially 60-65 other systems from the UvA. The LRS is designed to work at scales above 100 billion records and will enable collecting student activity streams, querying and administration. The LRS is planned to be the basis for several pilot projects focusing on applications and data visualization for potential users.

Normative Stakeholder theory

Modern management literature takes the concept of stakeholders into consideration since Freeman (1984) published his significant book: *Strategic Management: A Stakeholder Approach*. He aimed to enable managers to understand and adequately and effectively manage stakeholders. He defined stakeholders as “*any group or individual who can affect or is affected by the achievement of the organization's objectives*” (Freeman, 1984, p.46). Stakeholders have to be identified in order to manage their claims and to be aware of their influence, (multiple) roles or even their existence. According to Mitchell et al. (1997), Freeman's (1984) definition is a very broad one based on the “*empirical reality that companies*

can indeed be vitally affected by, or can vitally affect, almost anyone” (p.857). Setting boundaries thus is necessary when it comes to stakeholder identification and classification. Also, effective prioritization is needed as treating stakeholders equally will be cost ineffective and “will potentially conclude in a stalemate with opposing positions” (Currie et al., 2009). In the significant article of Mitchell et al. (1997), the basis of normative stakeholder theory was formed by researching the potential positive influence between stakeholders’ possession of three attributes (power, legitimacy and urgency) and stakeholder salience (“the degree to which managers give priority to competing stakeholder claims” (Mitchell et al., 1997, p.869)).

Based on how many attributes stakeholders possess, Mitchell et al. (1997) identified seven types of stakeholders, as can be seen on Figure 1. Each stakeholder type has different characteristics.

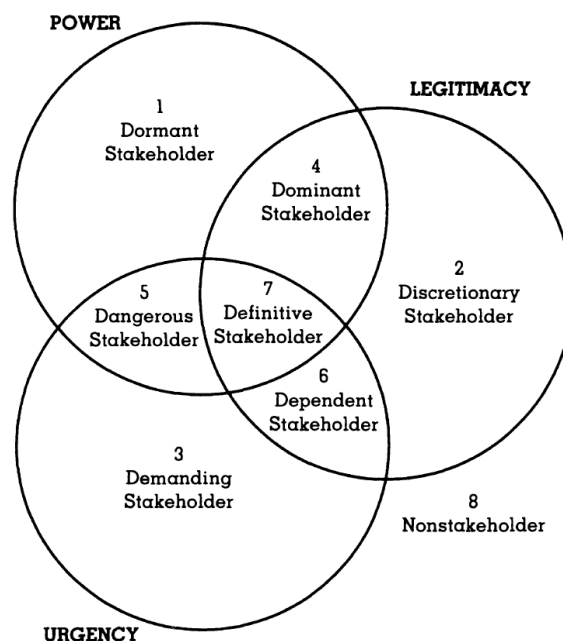


Figure 1. Stakeholder classification (Mitchell et al., 1997, p.874)

According to the model, if a person or group does not possess any of the attributes then it is not considered as stakeholder. Stakeholders possessing one attribute are called latent stakeholders (marked with 1, 2 and 3). These stakeholders are often not even recognized by managers. Stakeholders who possess two attributes are the ones who enter the ‘active’ zone from the ‘passive’. This category was named expectant stakeholders (marked with 4, 5 and 6). When all three attributes are present at individuals or groups, they are called definitive stakeholders (marked with 7).

Stakeholder identification

According to Vos and Achterkamp (2006), all potential stakeholder groups can be identified by individual brainstorming methods. During brainstorming sessions with 2 managers involved in UvAInform, all potential stakeholder groups were debated and were put on a list after arguing pro and contra in accordance with Freeman’s (1984) stakeholder definition. If at least two out of the three participants agreed that a stakeholder can affect or be affected by the

achievement of the project than it was put on the initial stakeholder map. If a stakeholder group was put on the map, and if it was related to another group that was already on the map, the relation was illustrated between them with a line or an arrow. This initial stakeholder map helped visualize the organizational structure of UvAInform project. Two key persons were identified who were assumed to be able to clear up the remaining concerns about non-identified groups or stakeholders whose position could not be accurately defined. Therefore a semi-structured in-depth interview was conducted with both of them. Both interviewees were asked at the beginning of the interviews to introduce themselves, their role(s) and responsibilities in the project. Due to privacy reasons, names of all interviewees in this research are not documented in this research. The first interviewee was identified as the coordinator of the UvAInform project and was therefore asked firstly to identify all stakeholders in the project, secondly to compare his list to the initial stakeholder map. The second interviewee was identified as the person being responsible for the communication bridge between the UvA and external expert organizations. Resulting from the brainstorming sessions and the two interviews, the final stakeholder map was drawn including 22 potential stakeholders, their relations and hierarchical structure.

Stakeholder classification

Methodology

In order to classify the stakeholders, ten persons were selected for semi-structured interviews in a way that all of them should be aware of the existence of most of the stakeholder groups and with the aim of representing as many core stakeholder groups with management functions as possible. Stakeholder groups outside the core bodies were not involved in this part of the research as most of them are not aware of many stakeholder groups and they would not have been able to judge whether particular stakeholder groups possess the attributes of power, urgency and legitimacy.

Before the interviews were conducted, participants were asked to fill in an online survey. The survey aimed to support the interviews as limitation of time did not allow the interviewer to ask about every stakeholder group separately. Filling out the survey also helped interviewees think of all potential stakeholder groups before the interview and this way they could be more prepared. Consequentially, the survey was not meant to support the research with quantitative methods and therefore it was not analyzed statistically. In the survey, interviewees could agree or disagree on a 9-point Likert scale with statements regarding all stakeholder groups' conditional possession of stakeholder attributes (power, legitimacy, urgency) (Mitchell et al., 1997). Additionally, these statements were also built on the work of Agle et al. (1999) who analyzed the construct validity of the attributes.

During the first part of the interviews, rationales behind participant's survey answers were detected in order to find out why they think that particular stakeholder groups are more or less powerful, legitimate than others and why different stakeholder groups' claims are more urgent than others'. Interview protocols were the same as by the previous ones with the exception that one interviewee was interviewed via Skype as he was abroad by that time.

When analyzing the interviews, majority's opinion on the possession of stakeholder attributes was taken into consideration, it determined the classification of stakeholders.

Results

Most of the stakeholders were recognized as definitive stakeholders meaning they possess every attribute. Although all of these groups should get the highest attention, there are some differences within the groups. Board of the UvA (1) and the Steering Group ICT (2) are on the highest level of the internal hierarchical structure of the UvA, huge majority of the interviewees declared them as one of the most definitive stakeholders, because formally they have the final words on every major decision. Lots of interviewees emphasized that every organization within the UvA is legitimate, but hierarchical levels influence the level of legitimacy. According to almost all interviewees, the two most important stakeholder groups were the Expertise Group Education (EGE) (10) and the Learning Analytics Focus Group (LAFG) (10). LAFG is the actual steering group of UvAInform project, they are deciding on every decision, however EGE is even more definitive as they can overrule decisions of LAFG anytime. They have the real power to cut budgets, allocate resources as bodies above them in the hierarchy make decisions mostly based on their advice. Every interviewee agreed on that every organization that is directly supporting the operational work of the project, possesses all attributes. These are the UvA IT Support Centre (ICTS) (3), the Learning Record Store (LRS) Steering Board (14), the pilot project managers (15) and the system developers (16). ICTS and developers are especially important according to some of the participants, for instance, Interviewee#5 said that *"The project is hugely dependent on them technically, ICTS has a large number of experts and they are the ones deciding on technical feasibility of pilot projects"*.

Every participant declared that data privacy regulation and support has significant role in the project, therefore UvA Legal Affairs (7) and UvA Ethics Committee (8) have the power and legitimacy to influence the project (even if they don't use it at the moment, so they are rather 'phantom' definitive stakeholders) and of course their claims would be very urgently handled once they are more involved.

There were four groups classified as definitive stakeholders, but it was not that simple to put them in the 'box' as some interviewees either did not have enough information on the stakeholder group or there were different and opposite opinions about their attribute possession. UvA Academic Affairs (6) is an organization on a high hierarchical level within the university. According to Interviewee#10, they are definitive, because *"UvAInform has to fit in the academic direction of UvA, so Academic Affairs surely does the power to influence the outcome of the project, UvAInform has to take Academic Affairs' claims seriously"*. On the other hand, few people said that they are too far away in the organizational structure to have serious influence on the project. Academic Affairs is also a phantom stakeholder group as it does not use its power. Most of the participants did not have enough information on how a potential cooperation with Uvadata (5) would be fruitful, but the ones who did, emphasized that involving managers of Uvadata could help accelerate the project. Consequentially, although they are not willing to cooperate at the moment, Uvadata does have power (even if

they do not use it, they are ‘phantom’ stakeholders as well), legitimacy and their claims would be handled urgently. UvA teachers, professors (19) and UvA study advisors (20) are one part of potential end-users of the project. They are not fully involved so far, but according to the majority of interviewees, maybe not strongly, but they do possess all attributes, for instance Interviewee#10 said that *“Faculty representatives in LAFG sometimes talk with professors and study advisors, and this way maybe just very weakly, but they can indirectly influence decisions”*.

Two groups were recognized as dependent stakeholders, which means they do not possess power, but they are legitimate and their claims are urgent for the management. UvA Portfolio Management (4) is high-level central body at the UvA, but *“They don’t have real power to influence the strategic direction of the project as they only have administrative functions”* according to Interviewee#4. As they are reporting to the UvA Board, they are legitimate and majority of participants said that their claims have to be managed urgently in order to get the project properly documented. Current UvA students (17) are dependent stakeholders as they had power in the project if they would be involved. Participants had different opinions on how urgently their claims would be managed, but more interviewees stated that they possess urgency even if not as most of the definitive stakeholders do. As they are the primary end-users of UvAInform, almost every interviewee would delegate power to them and this way make them definitive in the project. The difference between current UvA students and the ‘phantom’ definitive stakeholder groups is that while UvAdata, Legal Affairs etc. do have a the power, but at the moment they are not willing to use it, current student do not have the power, therefore they are dependent on the management of UvAInform, who could give it to them.

Three groups possess only the attribute of legitimacy (discretionary stakeholders). External expertise groups (9) do not have power to influence the project and their claims are also not being managed urgently enough according to the majority of participants. Although they do not have as high legitimacy as internal organizations, they are proper stakeholders of the project according to most interviewees. Interviewee#9 stated: *“External expertise groups don’t really have claims in this project, however, management of UvAInform should consider their guidelines, research directions and findings much more often and in a more urgent way in order to contribute to LA research in a proper way. More than one person should be connected with them in order to better communicate the external community standards”*.

Two other potential end-users were also recognized as discretionary stakeholders: UvA incoming students (18) and UvA educational program directors (21). As incoming students are not part of the organization of the university yet and educational program directors are only meant to be side users of the project, they only possess legitimacy.

Other expertise groups (9) and focus groups (11) within the UvA are non-stakeholders. They were potential stakeholders because they are competing for budget against EGE and LAFG, but this competition is not a real one, and they cannot influence the project, according to almost all of the interviewees. Future employers of UvA students and HR agencies (22) are

still not real potential end-users, they will not be involved in the near future, said majority of the interviewees.

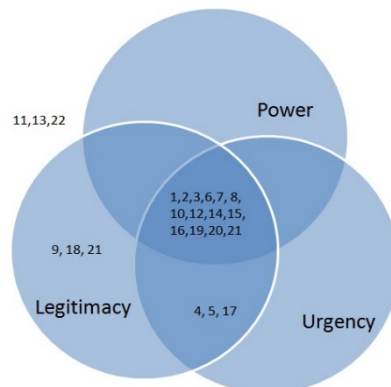


Image 2. UvAInform stakeholder classification

Conclusion

Using qualitative methods (brainstorming, semi-structured interviews some backed up with a survey) and applying normative stakeholder theory, 22 stakeholder groups were identified and classified. Classification model did not provide clear distinction between the majority of stakeholder groups, as most of them were defined as definitive stakeholders. This still leaves project management struggling with the problem of how to differentiate them and their claims. Every definitive stakeholder group should get high attention, but it might make it almost impossible for the management to reconcile so many claims with the highest attention, therefore differentiation is needed. Results of the classification model indicated that besides having differences in attribute possession (there are many groups more powerful, legitimate etc. than others), there are three subcategories to be differentiated. Firstly, there are the ‘real’ definitive stakeholders, for instance EGE and LAFG that apply and use their attributes unequivocally. In general, management teams are assumed to represent this category as they need to use their attributes to run the project. Secondly, the ‘partially phantom’ definitive stakeholder groups who are the formally the most powerful and legitimate groups with the most urgent claims, but they are not involved in the operational processes and only use their influence when they really feel it is necessary. In the UvAInform project, CvB and Steering Board ICT represented most likely this subcategory, in general, shareholders of organizations where projects run are assumed to be these groups. Lastly, there are the ‘phantom’ stakeholders who do have all the attributes but do not use them, simply because they do not have an interest in using them. Uvadata can be a typical example for this category in UvAInform, while in general, potential suppliers and strategic partners could fit in this class. It should be the management’s responsibility to convince ‘phantom’ stakeholder groups to cooperate, this way raising the chance of a more successful DW implementation.

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LEARNING ANALYTICS OF A MOOC WITH A TERMINAL EFFICIENCY OF 22.35%

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Introduction

On November 4, 2012, The New York Times declared 2012 as the year of the MOOCs (Massive Open Online Courses), due to the impact that they represented in the process of teaching and learning (Pappano, 2012). Since their inception in 2008, this new modality of sharing knowledge has positioned itself between the tastes and preferences of those interested in continuous education.

However, it was in 2012 when a great tsunami offer of MOOCs took place (Hennessy, 2012); soon they became present through different education platforms. From then on, the way of transmitting knowledge, collaborating and learning has been extended through these courses, which did not replaced the original method; the presence of MOOCs does not imply the role of universities with their face-to-face format is obsolete. Rather, MOOCs can complement the educational offer for those who seek additional material to strengthen their professional career, update knowledge, and acquire learning about areas of interest or even for those who seek access to preparedness beyond high school education (Billings, 2014; DeSilets, 2013).

This paper presents the results obtained when calculating the terminal efficiency for 12 MOOCs offered between 2013 and 2014 by a well renowned Latin American University. The results obtained indicate that some of the MOOCs offered by the University have a terminal efficiency above 6.5% which is the average recorded in the literature (Jordan, 2014); however, one of the courses reported an atypical terminal efficiency when 22.35% of the joined participants completed the course, fulfilled the course's activities and obtained the declarative of achievement. The detailed analysis for the MOOC that had an atypical terminal efficiency is presented: for this course in particular, a description of the participant's characteristics, of the technological resources used and of the tools and teaching strategies implemented by the academic staff is included. Finally, the findings suggest that to evaluate the success of a MOOC it is necessary to generate metrics other than those employed in the evaluation of *face-to-face or hybrid courses*.

Reducing dropout through learning analytics

According to their definition, the courses offered through the use of technology, housed in an educational platform, not linked to a formal registration at a certain University, with no deadline to register and no penalty for abandonment, are regarded as massive open online courses or MOOCs (DeBoer, Ho, Stump & Breslow, 2014). To conceptualize them, each of the terms “course”, “online”, “massive” and “open” have been redefined and reinvented on a number of occasions, hence, it is difficult to offer a fully covering definition.

Usually when using the terms “massive” and “open”, it means that the course will be available to any person showing interest and self-motivation to register. However, these terms usually do not refer to the fact that in the same way, MOOCs may experience massive departures of participants at any time; most of the times these terms are not linked with desertion. It is valid to say that who registers as a participant in a MOOC is an individual, self-motivated for learning and that the reasons for self-motivation among participants will vary in origin and over time. Due to this component of variability and the fact that participation depends only on them and not on the University who teaches them, when measuring the MOOCs’ success it is necessary to pay special attention to how the parameter is calculated. In addition, this new method opens the door to be creative in the generation of new metrics to evaluate them (Jordan, 2014).

Terminal efficiency

Terminal efficiency as the percentage resulting from dividing the number of participants who received the declarative of achievement from the educational platform, divided by the total of registered participants (EduTrends Report, 2014). Jordan (2014) calls this same statistical *completion rate*, and sets that it will be equivalent to the ratio between the total numbers of participants that met the criteria of the course for the declarative of achievement with respect to the total number of registrations.

In the research done by DeBoer et al. (2014), the authors also estimated the completion rate in this same way; however their conclusions suggested that it is necessary to redefine the way in which the MOOC achievement is measured. Ho et al. (2014) also suggested the need to rethink the metrics in the MOOC’s calculation, taking advantage of the different types of information generated by these kind of courses; for example, the number of accesses to certain video or the number of downloads of certain document.

According to Jordan (2014), the average total number of participants at a MOOC is around 43,000; of this amount, 6.5% complete the course. She also establishes that there is a negative correlation between the total number of participants who complete the course and the length of the same; that is, when the duration of the course extends, the number of participants who complete the course decreases. This gives rise to the explanation of the following key concept within the theoretical framework.

Dropout rate

The term dropout is widely used in Latin America to refer to the abandonment of school as a multifactorial situation experienced by unrolled students. In the case of online education, there are many factors that can influence the decision to leave the virtual learning space, including the level of required prior knowledge, the lack of certain necessary skills to take the course on a self-directed way, a change in the layout, a decrease in the level of self-motivation or the loss of confidence at achieving the expected result (Milligan, Littlejohn & Margaryan, 2013).

Billings (2014) mentions among the disadvantages of MOOCs the fact of not having sufficient information to identify the cause by which less than 10% of participants enrolled in the courses comply with all activities and finish it. Among the possible reasons that she mentions are the required improvement in the design and implementation of the MOOC, uncertainty on the recognition of the acquired learning (by universities and employers) and low adaptation to the registered e-learning model.

On the other hand, Ho et al. (2014) estimate the dropout rate as the complement to the percentage of active students in the platform; defining the latter as the ratio between the number of students who have been active on the course during the last week and the total of registered participants; in addition to the above, the authors mention that the dropout rate will be equivalent to the attrition rate of the course in the given period. As a result of their research, they found that about 35% of the total of records in a particular MOOC never check the contents of the course (momentary motivation to registration); only 50% of the remaining 65% of records who sees the course's content, access the first activity assigned within the course.

Research project

The main objective of this research project was to evaluate the terminal efficiency of the MOOCs offered by one of the universities of greater recognition in Latin America and leader in providing distance education; the following sections will describe the context of the research, the applied instruments, the dimensions of analysis and the participant population. Possessing an extensive infrastructure to offer online programs, the offering University of the MOOC under study, is a pioneer within the private universities in Latin America. This educational institution is governed by five values; Innovation, Global Vision and Teamwork are three of its values related to the proposed avant-garde offer of massive open online courses.

The MOOCs offered by the University through Coursera cover different areas of study; they correspond to the area of Mathematics, Physics, Innovation, Entrepreneurship, Latin American Culture and Strategic Educational management, to name a few. The experience of the involved personnel in the design and implementation of the MOOC in conjunction with the position of leadership that the University occupies could be two major factors of influence on which the terminal efficiency rate relies and even had an outstanding higher level than the

average reported in other research when the calculated terminal efficiency was of 22%; however, the foregoing has not been proved statistically.

Research instruments

As already mentioned above, in this document the definition for terminal efficiency corresponds to the percentage resulting from dividing the total number of participants who received from Coursera the declarative of achievement among the total of registered participants (EduTrends Report, 2014). The source of information is the panel of statistical analysis that Coursera offers on its Dashboard.

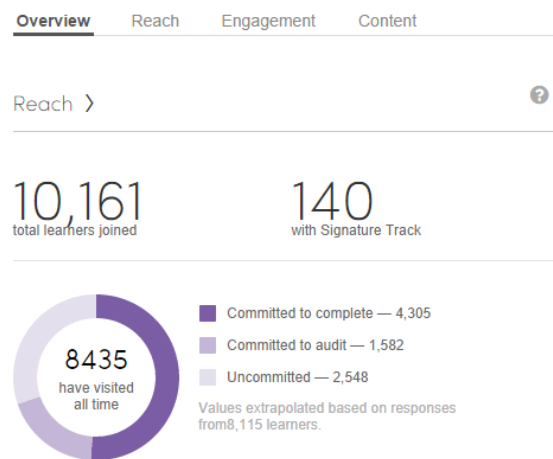


Figure 1. Dashboard of the learning platform Coursera

Since the data required to estimate the terminal efficiency is provided by Coursera, the same criteria was used for all the courses, the methodology has been standardized and the source of the data is validated. The aim of this paper is to compare the terminal efficiency among the MOOC offered by the University; however, we also present a breakdown analysis of the atypical course by type of declarative granted, in order to submit a detailed analysis of the information collected.

Population and sample

The maximum total number of enrolled participants in the courses will be used for the calculation of terminal efficiency, being this total of people made up of those who signed up and never performed any activity (registration was the result of a momentary motivation), those who were only reviewed the course content without performing any activity, those who carried out some of the activities and those participants who meet the criteria required to obtain the declarative of achievement. In the research published by DeBoer et al. (2014) and Jordan (2014), the authors conclude that there is a need for new metrics to evaluate the success of the MOOCs, this because of the difference with respect to courses in traditional mode there is a high dropout rate among participants of the massive and open online courses. For the atypical case studied, the terminal efficiency is calculated with respect to participants who remained active during the complete course, as the above mentioned authors propose it.

Results

Between January 2013 and summer 2014, the University under study and Coursera, in conjunction, received 209,871 requests to participate in their 12 MOOCs. Academic authorities of the University indicated that on the August-December 2014 term, the academic institution had around 95,000 students formally enrolled in all the educational programs offered; taking this statistic as reference, the total amount of participants in the offered MOOCs approximately equals to 220.92% of the total number of students enrolled in the institution. From the perspective of strategic positioning the University is implementing, the main goal of reaching not physically attainable markets has been covered successfully; also it is fulfilling a social commitment to share knowledge at the same time it takes position as an innovative University in teaching-learning processes.

The findings presented below have been organized in the following manner: first there is the analysis of terminal efficiency for the 12 MOOCs offered by the University between January 2013 and summer of 2014 is presented; subsequently, the characteristics' analysis for the participants of the MOOC whose terminal efficiency was the 22.35%; and finally, we present the technological resources, tools, and educational strategies of the MOOC with atypical terminal efficiency.

Comparative analysis between MOOCs

Mathematics, Physics, Innovation, Entrepreneurship, Latin American Culture and Strategic Management Education are some of the disciplines of study that encompasses the contents of the MOOCs offered by the University and studied for this research. In equal magnitude of diversity is the rate of terminal efficiency calculated for each of them, results showed rates from 1.2% to the 22.35% (Figure 2). It is important to mention that the average terminal efficiency for the MOOCs offered by the University is 4%; percentage equal to the documented by the Graduate School of Education at the University of Pennsylvania in their recent research on MOOCs (Penn GSE, 2013).

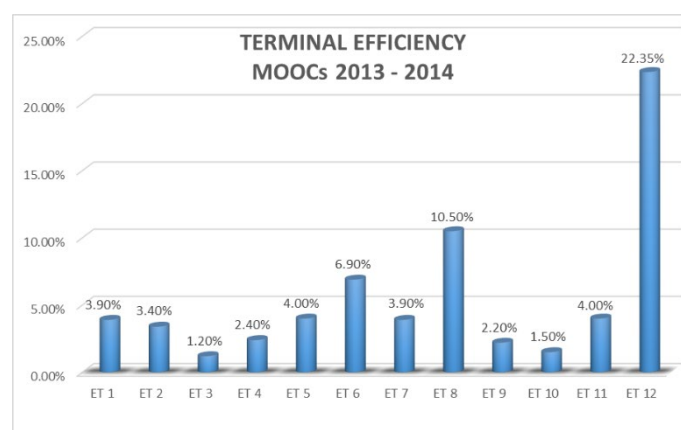


Figure 2. Rate of terminal efficiency with respect to the registered total per course

Leaving aside the atypical case, the terminal efficiency calculated for the rest of the MOOCs is between the interval of 1.2% and 10.5%; it is important to point out that the courses with the lowest and highest terminal efficiency correspond to the two courses with the higher amount of participants: MOOC 3 records 35,901 and MOOC 8 with 24,262 participants registered. However, although it seems that a 1.2% of achievement for MOOC 3 is a low rate, when this percentage is multiplied by the total number of participants at the course, the quantity of 431 participants meeting Coursera's achievement declarative is obtained.

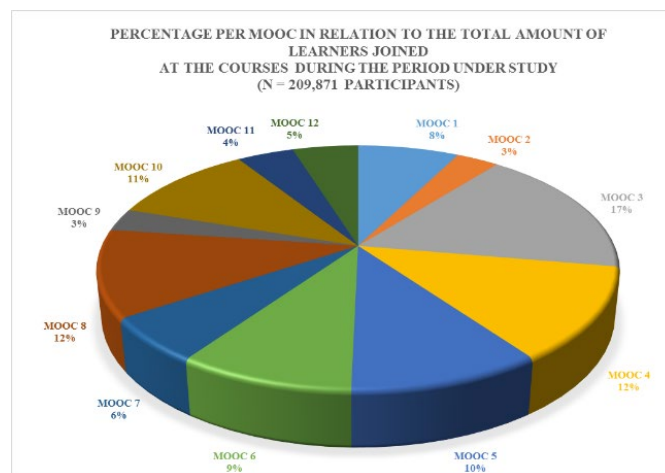


Figure 3. Percentage of enrolled by MOOC with respect to the total of MOOCs offered by the University

In the specific case of the atypical course that had 10,161 as total amount of enrolled participants (MOOC 12), 2,271 were awarded with the declarative of achievement; 506 participants received declarative of normal achievement and 1,765 participants received declarative of achievement with distinction. It is important to mention that for this course in particular the required criteria to receive the declarative of achievement with distinction included the participant's compliance with all assigned activities and also a final average equal to or higher than 90; to obtain the declarative of normal achievement instructors set a final average equal to or higher than 70 and below 90 and the submission of all the activities. With the above information, it can be concluded that with respect to the maximum total of enrolled participants, 17.37% of them presented a high level of commitment to the course attaining the declarative of achievement with distinction; 4.97% of the maximum total of enrolled participants obtained the declarative of normal achievement (Alemán de la Garza, Sancho-Vinuesa & Gómez-Zermeño, 2015).

In recently published studies, one of the most common issues is the urgent need to define new ways to measure the success of the massive open online courses. Both in the article published by DeBoer et al. (2014) as well as in the one published by Jordan (2014), they concluded that a better metric for determining the rate of compliance (statistically equivalent to terminal efficiency) is to consider the percentage of declaratives of achievement with respect to the registered population that remained active throughout the duration of the course. The learning platform Coursera offers the data of total number of students who were visiting the course's page; for the particular case of the atypical course (MOOC 12), 8,435 participants

were registered as continuously active. Redefining the terminal efficiency as the percentage of enrolled participants who obtained the declarative of achievement with respect to the total of continuously active registered participants, the calculated terminal efficiency is 26.92%. It is also possible to calculate the dropout rate, for this course was of 16.98% since 1,726 records showed no activity in Coursera (see Table 1).

Table 1: Descriptive statistics of the course with atypical terminal efficiency

Total amount of enrolled participants	10,161
Total amount of continuously active participants	8,435
Total amount of enrolled participants with declarative of achievement	2,271
Terminal efficiency with respect to the total amount of enrolled participants	22.35%
Terminal efficiency with respect to the total amount of continuously active participants	26.92%

Characteristics of the participants: The atypical MOOC

The reported characteristics for the participants of the MOOC with an atypical terminal efficiency are calculated from the survey that was part of the registration process to the course. Some of the descriptive statistics obtained are: 39.82% are male and 60.18% female; 38 years old is the participant's average age; 65.58% of the participants reside in Mexico and 34.42% outside Mexico. Also, 74.38% of participants have as main professional activity *Teaching / Pedagogical Technical Advisor* and 56.13% work at a *Public School*. Finally, 69.99% of the survey's participants identified themselves that the main reason for participating at the MOOC was the desire to upgrade within the models of strategic educational management. See Figure 4.

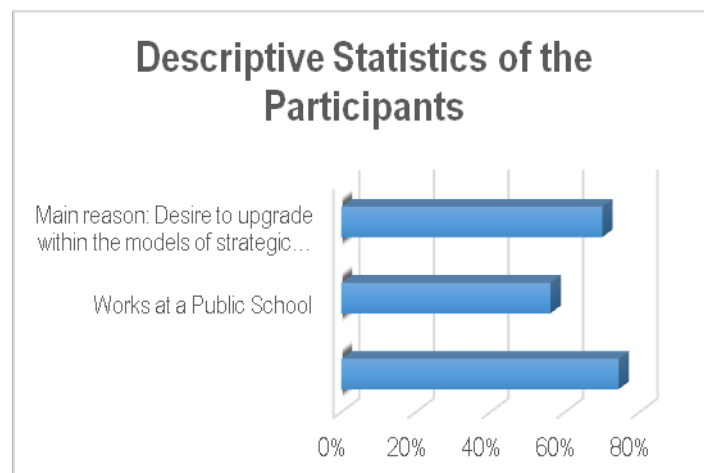


Figure 4. Descriptive statistics of the MOOCs' participants

It is important to note that for the specific case of the atypical course, a 98.04% of respondents in the survey expressed their intention of completing the course; this can be taken as an attitude of commitment since they hoped to receive a good learning experience. That same survey shows that 36.81% of respondents expressed as one of their main expectations to get a certificate of participation at a course taught by the University. This result can be used as an estimate for the institution's market positioning.

Conclusion

The educational platforms have led universities from different countries to adopt the philosophy of sharing knowledge free of charge or at a symbolic cost when a validated certification is expected. The reasons leading to these universities to offer MOOCs are part of positioning strategies, of attracting national and international talent for projects of educational innovation and social commitment, to name a few. However, there must be parameters to evaluate success. In the case of the MOOCs, an example of these parameters is the terminal efficiency rate, statistical employed by one of the leading universities in Latin America, and determined as the percentage of students scoring the declarative of achievement with respect to the maximum total number of registrations.

Within the statistical analysis, the 209,871 participants of the MOOCs offered by the University between January 2013 and summer of 2014 was broken down. The analysis made for the terminal efficiency minimum and maximum rate in relation to the number of participants enrolled at the MOOCs showed that a low terminal efficiency expressed as a percentage is still attractive to the academic authorities in terms of total amount of participants. Descriptive statistics of those who were registered in the course of strategic educational management were reported; among the most noteworthy findings is the terminal efficiency rate of 22.53%, higher than reported by other courses at the same University, or even above the reported in the literature (Jordan, 2014).

Derived from this research, some future research is proposed to further expand the knowledge base of how to increase terminal efficiency in a MOOC. One of the suggested future researches is the statistical validation of the correlation between the initial intention and the terminal efficiency rate. A concern about proving it statistically arises due to the fact that instructors and academic staff were involved during the design and implementation stages on motivational and tracking activities for participants. Resources were allocated to keep updated announcements and to procure a pleasant and enriching collaboration through virtual communities. Also, unlike the proposals of Jordan (2014) and DeBoer et al. (2014), we propose to calculate the terminal efficiency of MOOCs considering only participants classified in the platform as “committed to complete” and “committed to audit”, with the intention of debugging the database of registered participants by eliminating the participants that the educational platform reported as “uncommitted”, this because they have been identified as participants who reviewed a low percentage of the course’s content and also did not carry out the activities assigned.

Thus, we concluded that to evaluate the success of a MOOC, it is necessary to generate learning analytics metrics other than those employed in the evaluation of face-to-face or hybrid courses. We can see that the massive and open online courses have generated great expectations because of their potential to change the relationship between students and teachers, the Academy and community in general. This research presents important points, unlike documented literature, one of the studied MOOCs presented a terminal efficiency higher than the average. With this information we seek to expand the knowledge base of how

to increase terminal efficiency in a MOOC, and in this way have an impact on their quality and contribute to the improvement of education and the offer of MOOCs.

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WEB-BASED ANALYSIS OF STUDENT ACTIVITY FOR PREDICTING DROPOUT

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Introduction

Persistence in learning processes is perceived as a central value in education (Horowitz, 1992); therefore, dropout from studies is a prime concern for educators (Barefoot, 2004). Since the increase in student usage of online learning materials on course websites, as well as online courses (Allen & Seaman, 2014; Parker, Lenhart, & Moore, 2011), it is essential to address the dropout issue in a wide array of configurations from web-supported learning to fully online courses. Additional tools and strategies must be developed to allow instructors or other educational decision makers to quickly identify at-risk students and find ways to support their learning in the early stages, before they actually drop out. The ability to detect these students during the semester, and not at the end of the course, can also serve as a basis for the development of appropriate assistance mechanisms which will enable those students to complete the course and even to fulfil the curriculum for their degree.

In order to meet the challenge of identifying dropouts early, it is possible to use the large databases that are created automatically in the Learning Management Systems (LMSs) servers. These databases contain enormous amounts of data relating to learning processes and learner behaviours on course websites. This data can be analyzed in order to evaluate the learning processes (Horizon Report, 2014); improve teaching and learning; optimize the construction of learning systems and their operation (Ai & Laffey, 2007; Romero & Ventura, 2007; Lu, Yu & Lin, 2003); and can even be used to predict potential dropouts and failures (Macfadyen & Dawson, 2010; Lykourantzou et al., 2009; Nistor & Neubauer, 2010).

The presented study focuses on identifying at-risk learners who might drop out from specific courses or from degree studies in general, based on the analysis of student activity in the course website data which is accumulated in the log files of the LMS, Moodle. Student data from six courses in the disciplines of exact science were analyzed. In these courses, the dropout rate is usually very high. Furthermore, students who fail these courses occasionally drop out of their degree study as well. The information obtained from the presented analysis may assist teaching staff and other institutional mechanisms in supporting and retaining their students. This analysis enables the instructors to monitor student activity on the website throughout the learning process during a course, not only at the end, in order to detect students who are not using the website, or students with unexpected behaviour. The main purpose of getting this information is to allow the instructor to contact students who could

potentially abandon their studies, and to understand the reasons why. Additionally, this analysis will allow instructors to understand the scope of course material usage and patterns so that they can make improvements. This analysis can be used by educational decision makers too, according to ethical guidelines, since it will allow them to see the information on a campus level; to identify students with potential for dropout in relation to different faculties, instructors, types of courses, or other chosen criteria. Thus, intervention programs for potential dropouts can be initiated and action can be taken for instructors that are observed to have high dropout rates from their courses.

Methodology

Research aims and questions

The aim of the study is to identify learners who are at risk for dropping out from specific courses or from degree studies through analyzing the large web log files accumulated in the LMS by the specific courses. The study addressed the examination of student activity on course websites that may be associated with dropout. Following that variables and measurements that may alert to dropout were developed and the correlations between them and the completion of the course and student status regarding continued studies the following year were tested. Thus, the research questions were: i) What are the variables and measurements regarding student activity on course websites that may alert to dropout? ii) Is there a correlation between the defined variables and measurements that may alert to dropout and successful completion of a course? ii) Is there a correlation between the variables and measurements that may alert to dropout and the termination of studies the following academic year?

Research field

The study was conducted on six courses in the exact science faculty, in the fields of mathematics and statistics taught at a large university during one semester in 2013 (N = 718 students; 6 instructors). All courses were using the Moodle LMS and their websites contained varied contents related to the learning issues, especially exercises. These courses were chosen due to the fact that in these courses the dropout rate is very high. Furthermore, students who fail these courses occasionally drop out from their degree study as well.

Method and procedures

Our main hypothesis is that academic students heading towards dropout will first become absent from course websites. Essentially, early traces of dropouts will be manifested first on course websites; hence, they can be traced in the LMS log files.

During the study, different variables that define students' activities on the website were calculated, and the log-files of six courses in the fields of mathematics and statistics were retrieved and analyzed. Different variables that may alert to dropout in real-time were calculated and a set of alert variables were developed for identifying these at-risk learners during preliminary stages of the course. Then, the correlation among the student's activity in

the system, successful completion of the course, and the continuation of studies in the following year were tested.

The study was conducted in three stages.

Stage 1

Data collection – While using the course websites Moodle automatically accumulates a vast amount of data regarding student activity (such as the number of actions, their types, timing, and frequency) in its server web logs. Through web-mining techniques, access to the server database was enabled and data regarding 718 student activities in six selected courses was retrieved. The data was organized in a file in which each action is represented by: Student ID, the date and time of the activity, and its type (such as viewing content, uploading an item, sending a post to a forum, and submitting a quiz or an assignment, etc.). 170,445 actions were demonstrated in these log files. Notably, we were committed to protecting student privacy. Data was handled very carefully according to ethical guidelines.

Stage 2

Data analysis was performed on the six courses in order to identify the students at risk for dropping out – student activity variables were calculated and the index, which represents alerts for an exception activity for each student, was constructed.

Three groups of variables were defined (Table 1): the first group measures the student usage of the course website. The variables in this group relate to course level (V_1 - V_4); the second group measures the intensity of the student activity on the website, aiming to identify any unexpected or extraordinary changes in activity. The variables in this group are related to student level (V_5 - V_8); the third group of variables refer to student grades and academic status – student final grades and learning status the following year (V_9 - V_{10}), which shows if the student did or did not drop out.

Table 1: Groups of variables measuring student activities

Variable name	Variable description
<i>student usage of course website variables (course level)</i>	
V ₁ : No. of all student actions during the semester	Total number of student hits (total number of records for all students in the log file).
V ₂ : No. of all student actions during specified period of time (e.g., per month)	Total number of student hits recorded each month during the semester (total number of records for all students in the log file for each month).
V ₃ : Average of all student activity days	Average number of days in which the actions were performed by all students.
V ₄ : Average of all student activity (hits) in the course in a specific month	Average student hits each month during the semester (Average of records for all students for each calendar month).
<i>Variables for measuring the intensity of student activity on a course website (student level)</i>	
V ₅ : No. of actions for the entire semester	Total number of student hits (total number of records for a specific student).
V ₆ : No. of actions in specified period of time (e.g., per month)	Total number of student hits every month during the semester (total number of records for a specific student in the log file for each month).
V ₇ : Relative No. of actions in relation to other students in a specified period of time (e.g., per month)	The ratio between the number of activities for a specific student and the average of all students' activities (hits) for a course. Each month during the semester, a relative score was calculated for each student.
V ₈ : No. of activity days	Total number of days in which the actions were performed.
<i>Student status variables (student level)</i>	
V ₉ : Student final grade	Results at the end of the course: passed, failed, or did not complete (meaning studies were abandoned before the course ended).
V ₁₀ : Learning status of student the following academic year	The distinction between an active student who continued his/her studies, and an inactive student who abandoned his/her degree studies.

Using variables from the first three groups, a fourth group of variables was calculated. This fourth group contains alert variables for unexpected student activity that is represented in the alert index (Table 2). A set of measures (V₁₁-V₁₄) were defined that reflect student inactivity or an unexpected change in student activity intensity over time, for example, a month with inactivity or a month with low activity (in this case, lower than 70% of the classroom activity average that month). Consequently, student activity intensity on course websites each month was reflected in three main variables: amount of activity during this period of time (V₂), the ratio between the student activity and the average of all student activity during the course (V₃), and the number of days during which the activity occurred (V₄).

Table 2 Variables for alerting inactivity or unexpected change in student activity

Variable name	Variable description
<i>Variables for alerting inactivity or unexpected change</i>	
V ₁₁ : No. of alerts for monthly inactivity	Each month in which inactivity was identified a warning flag for monthly inactivity was turned on. For each student, the number of warning flag months was calculated.
V ₁₂ : No. of alerts for monthly decreases in activity compared to the class average (low average of actions)	When the number of student actions was at least 70% lower than the class average that month, an alert flag was turned on for low average activity. For each student, the number of months in which this warning flag was turned on was calculated.
V ₁₃ : The calendar month in which the inactivity alert appears	The name of the first calendar month during the course in which the alert flag for inactivity appeared the first time.
V ₁₄ : The calendar month in which the low activity alert appears	The name of the first calendar month during the course in which the alert flag for low activity appeared the first time.

Our working hypotheses regarding the identification of at-risk students before dropout through the students' activity in the course website is summarized in Figure 1.

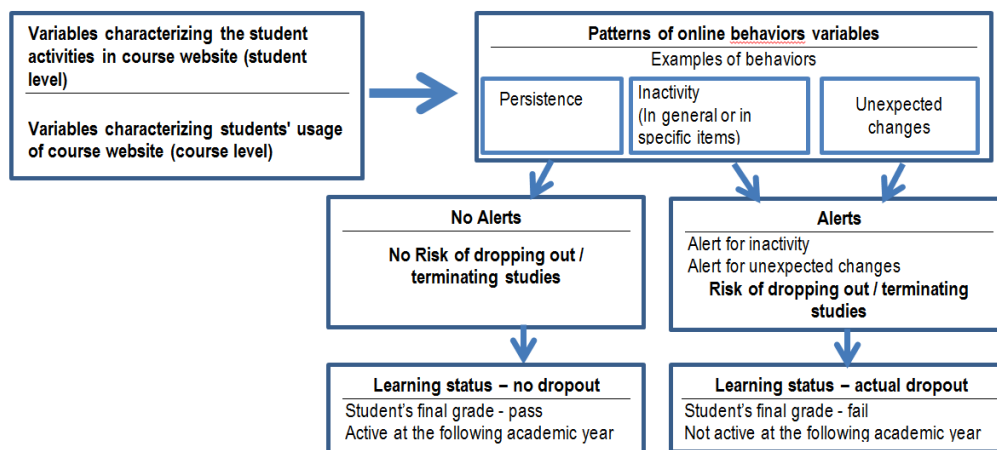


Figure 1. Working hypotheses for predicting dropout through the students' activity in the course website

At the end of this stage, the analysis for predicting dropout was performed. Three components are included in the analysis: the first component is the input file which contains student activity variables retrieved from the LMS log files; the second component is a file containing the measurable variables which may provide alerts for unusual activity; and the third component is the output file of students who were marked with flags as potential dropouts, generated based on monthly changes in student activity, when unexpected or unusual activity was shown regarding specific students (Figure 2).

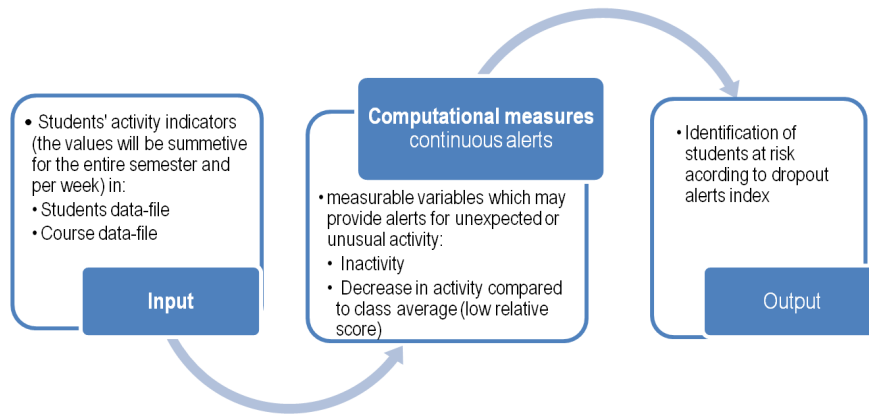


Figure 2. Web-based analytics tool for predicting dropout

Stage 3

Examination of correlations – The alert variables for each student were analyzed and tested against two different variables: the completion status of the course – whether the student passed, failed, or did not complete the course; and the student's academic status the subsequent academic year – if he/she continued studies at the university. Correlation analysis between alerts and student status in regards to course completion and continued studies the following year were performed.

Results

Variables and measurements regarding student activity on course websites that may alert to dropout

Variables and measurements regarding student activity on course websites that may alert to dropout based on student activity intensity were identified. Student activity intensity can be analyzed relating to different features available to students through the course website. Looking at one student's activity alone is not enough. A comparison between the activity of a specific student compared to the rest of a class is required, in order to understand whether the observed activity is expected or not, according to the course requirements.

While exploring the student activity on the websites, different kinds of patterns were found. Figures 3 and 4 show examples of different behaviours that may indicate a student is at risk for dropping out. These figures show changes in the intensity of a student's activity in relation to the average intensity of the students in the course.

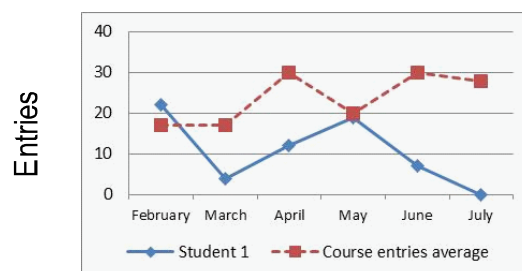


Figure 3. Activity intensity of Student1 compared to average intensity

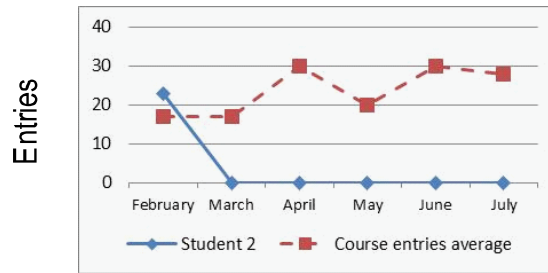


Figure 4. Activity intensity of Student2 compared to average intensity

Testing the defined variables and measurements that may alert to dropout

Most of the students performed between 100 and 300 activities on the website during their course. For each student, a relative score was calculated, which was the ratio between the number of the student's activities performed and the average activities of all students in the course for a period of one month. Examining the distribution of the relative scores by quartiles shows that most students are located in the 4th quartile with the score of between 0.83-1.77. Most students are active for 30-60 days during the semester.

In order to discover valuable information concerning identification of dropout's early traces on course websites, the websites should be meaningfully integrated in the course learning processes. In this study, no significant learning processes were conducted on three course websites, thus, no valuable information was provided concerning the potential drop out of students from those courses. For this reason, the findings of only three courses are presented in this paper. Analysis of the three courses shows that 41 students out of all students in those courses ($n = 362$) were flagged as potential dropouts (Table 3). Eventually, a large percentage of the students whom our analysis had flagged as at-risk did not finish the course and/or degree. 25 students actually dropped out from the courses or were not active the following academic year, meaning that the prediction was 66% accurate. Meaning that, the changes in a student's activity during the course period could identify a learner at risk in real time, before he/she drops out.

Table 3: Summative results regarding at-risk students and actual dropout

Course ID	No. of students in courses	No. of students identified as at-risk	No. of students who dropped out/were inactive the following year	Prediction %
Course 1	124	10	16	63%
Course 2	120	4	5	80%
Course 3	118	11	20	55%
Total	362	41	25	66%

Correlation between the alert variables for student dropout, completing the course successfully, and learning status the following year

While examining the correlations between the intensity and student activity volume for the entire semester (using variables such as total number of student activities for the semester; the average number of student activities in relation to the average number of all student activities for the semester; and number of days in which students were active) and completing the course successfully, no significant correlations were found. Similarly, no significant correlations were found between those variables and continuing studies the following year. However, while examining the student activity every month and testing the correlations between the alerts for student dropout, completing the course successfully, and the status of the student's studies the following academic year, significant strong and positive correlation was found (Table 4). Significant correlations were found between completing the course successfully, the number of alerts for inactivity ($r = .533$), and the alerts for low relative activity ($r = .433$). Significant correlations were found as well between the two kinds of alerts and the status of the student's studies in the following academic year. Positive significant correlations were found between continued study status, the number of alerts for monthly inactivity ($r = 0.483$), and the alerts for low relative activity ($r = 0.466$).

Table 4: Correlation analyses between the alerts for and completing the course successfully
($N_{\text{students}}=718$)

	No. of alerts for inactivity	No. of alerts for low relative activity
Completing the course successfully	.533**	.433**
Learning status	.483**	.466**

** $p < 0.01$

The results of this study show that our main hypothesis is supported. Students most likely to drop out of a course will first become absent from the course website. Essentially, a dropout's early traces will be manifested first on course websites; hence, they can be traced in the LMS log files. These findings are preliminary and may be used as a basis for developing a web-based analyzing tool for predicting potential dropouts.

Discussion

Students continuously leave hidden traces of their learning activity in the LMS course log files. Some of these traces might be identified as initial stages in the dropout process. A web-based analysis for predicting student dropout was presented in this study using data from courses considered to be difficult and characterized by high dropout rates; in many cases these dropouts also quit their degree program entirely. By using the presented analysis, crucial information regarding student activity was provided for identifying at-risk students before they drop out. Unlike previous studies, which dealt with data analysis of fully online courses (Nistor & Neubauer, 2010; Macfadyen & Dawson, 2010), this study analyzed activities of web-supported learning in which the academic instruction is accompanied by a course website. The findings of this study show that certain characteristics of student web activity can indicate

potential risk of course dropout or even degree study termination. At-risk students might show changes in their behaviour, unexpectedly, such as inactivity on the course website or a reduced amount of activity in relation to the rest of the class. Furthermore, a high percentage of predicted dropout was shown and there was a strong correlation between the dropout alerts, course completion status, and continued study status. Students who were flagged using the analysis did not complete their course and/or discontinued their studies the following year.

From these findings, several preliminary conclusions can be drawn: firstly, the analysis of student activity in course web logs can serve as a tool for predicting student dropout from the course or even from degree studies. However, analyzing the web logs at the end of the learning process with summative measures is insufficient (Lykourantzou, et al., 2009). Analysis of overall usage data with measures such as the monthly average of student activity during the semester is also not enough to create timely flags and point to the potential for dropout. When considering the changes in student activity during the course study period, it is possible to perceive the potential for dropout from the course and studies in general. When the data was examined on a monthly basis during the semester and potential dropouts were flagged, a large percentage of these students did not finish the course and/or degree. Consequently there is significance for analyzing the student activity data over time and measuring the changes revealed in their behaviour. One explanation for this finding may be related to the fact that at the beginning of a course many students enter the course website frequently, perform a reasonable amount of actions or even above average, and at more advanced stages of the course, for various reasons, they stop or greatly reduce their volume of activity; and this change indicates a potential for not completing the course (Hwang & Wang, 2004; Hershkovitz & Nachmias, 2011).

The proposed analysis focuses on predicting learner dropout during the preliminary stages of academic course study by using an early warning system. Future research will extend the analysis to examine significant additional variables that may affect the predictability and potential for abandonment of studies: variables related to course characteristics, such as course type (compulsory or elective); types of material on the course website; and variables related to different types of student activity on the website, such as the nature of student activity (active or passive). In so doing, a dashboard-like, web-based visualization tool will be developed for educators. It will be easy to use and will provide information at various levels: course, department and campus wide.

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WIN, WIN, WIN – AN ASSESSMENT SYSTEM THAT WORKS FOR STUDENTS, STAFF AND THE ACADEMY

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This paper provides a case-study of Review, a direct-marking and assessment management system in use at the University of New South Wales (UNSW), Sydney, Australia. The current state of theory and practice in systems facilitating assessment for learning are discussed, before essential features of future oriented assessment management systems are proposed. The underpinnings and affordances in our experience of using Review for students, staff and administrators are then described. Review, designed by academics for academics, is used in several Australian universities, and in three faculties, over one hundred courses and by thousands of students and staff each semester at UNSW. A brief description follows.

Review is used for both direct criteria based marking and as a marks repository for collecting assessment data for courses and Program (Degree) assurance. Feedback is provided through Review, and internal mapping connects criteria marks to course, degree and Program outcomes. Therefore, assessment data is connected across the length of student degree programs. Native affordances of the system are described. The focus of this paper is on how the system supports a holistic approach to assessment activity for markers, students and administrators. This case-study outlines how this 'virtuous cycle' supports and improves student learning, staff assessment and Program (Degree) assurance and reporting over previous processes. This is exemplified with detail of the system's learning / assessment data structures, the intuitiveness of its interfaces and workflow designs, marking efficiencies and the supportive richness of the data recoverable by all users.

Current state

Current university wide assessment management systems typically record the crumbs of student achievement. In many cases, central systems hold only a final course mark and associated course grade. Some carry the records of the component course task marks. However few university wide systems carry the substantive marks data set that tracks the detail of student achievement at levels below the task mark. Even fewer universities preserve and centrally record the richness of the formal feedback and advisement provided by staff resulting in a loss of business intelligence, effort and the inherent value of feedback to students, staff and the organisation.

Consider that inside tasks, student performance is judged in fine detail. These judgments of and feedback on 'learning moments' are invaluable as a record for students and for

universities. They exist in myriad contexts, separated in time, sometimes ‘live’ and unrecorded, often held in a range of disconnected systems. The opportunity cost of unrecorded feedback is an irredeemable severance of future connection by systems based approaches to these learning ‘moments’ – for all parties.

Typical legacy university assessment systems record a thin trail of evidence of student achievement and progression. Often this is as simple as a final summative mark per course and subsequent grade. A pastiche of passing grades equates to a degree. But this provides little vision into the depth, variety and quality of the component parts of the individual’s learning. For the individual, these legacy systems tend to alienate, reduce their learning to a summative judgement that reduces their learning experience to a number or a grade. These approaches provide no satisfying basis to reconnect the learner with their experience of learning, which was hopefully rich but is in no way reflected through the records system.

By the same degree, the failure to collect granular data on graduate’s professional and discipline skills development, denies the institution insight into its people, processes, courses and programs. Informed by the recent advances in Learning and Academic Analytics, a great opportunity exists for more meaningful approaches to assessment (both formative and summative) to support learning (Dawson, 2012). A more constructive, holistically envisaged and systematically embedded management of assessment, feedback and learning progression is needed. This is the landscape for future assessment management systems to articulate and thoughtfully connect learning and assessment.

The success of transitioning to future assessment systems depends on an alchemical dance, where institutions embrace the challenge to transform and re-imagine practice, producing articulate and elegant systems design. These will demonstrate significant and immediate connection and efficiencies with all stakeholders (students, staff, managers and external bodies). Assessment systems design must embody the underlying intentions, and implicitly communicate what we value.

Therefore, future assessment systems must be designed from a base of the explicit articulation of what are the core institutional values and aims around learning. Value-Sensitive Software Development offers a framework for referencing the development of more explicit institutional ‘fit’ between the software systems we create and the ethos, intention and practices of education.

Optimally, the development of educational assessment management systems rests on respect for the whole learning community, its goals and its members. Future systems need to accommodate the legitimate needs and aspirations of the learners, staff and the academy. To conclude, future assessment systems will be more than simplistic marks repository and will be informed by achievable learning Analytics approaches (Dawson, 2012).

This paper advances Review as a successful example of a ‘future assessment’ system, agile, user-centric and holistically designed to concord with institutional values (promotion of learning). In Review, activity (framing assessments), achievement (judgement outcomes of

assessment) and feedback is explicitly, efficiently and ubiquitously linked to learning progress degree / program learning goals achievement, benefitting all parties.

Developed by Darrall Thompson and Mike Howard of the University of Technology, Sydney, is used in several Australian universities and has won national awards for educational technology innovation (Dawson, 2012). The system can carry description and data of formative and summative assessment events. Marks data, entered directly or imported, can be tagged for course marks finalisation, as barrier (must pass) course components and for inclusion or exclusion from course and program assurance reporting. The PHP – Apache base enables provisioning course and student feeds and outward marks transfer to established data-marts and other systems.

Affordances for students: direct marking

- Performance standards are explicitly framed through criteria frameworks;
- In-built self-assessment increases student engagement and focus;
- Student reflection through student comments facility;
- Performance based feedback is more targeted and actionable;
- Self-assessment is positively viewed by our students;
- Feedback can be attached in commented files to students;
- Not semester limited, so students can both look at past feedback;
- Run reports on their progress over time against tasks, criteria, Program Learning Goals and University Graduate Attributes.

Review's criteria based approach improves clarity around assessment for students. Markers explicit detailing of judgment criteria provides a common understanding of the judgment frame for both markers and students. Student self-assessment encourages student engagement with assessment, reduces passivity and develops a focus on developing accurate discipline self-judgment skills (Boud, Lawson & Thompson, 2013).

A 2013 study reported positive attitudes to the practice of self-assessment in Review at UNSW. Self-assessment and developing self-assessment accuracy were overwhelmingly viewed as a valuable professional skill. Despite positivity about embedded self-assessment practice, students reported that this was relatively infrequent – revealing a gap in the curriculum design of our courses and Programs. Students also commented on the targeted feedback provision and the clear, visually engaging interface. Research that suggests student engagement in assessment reduces passivity and encourages cognitive engagement was echoed by our students:

'It has certainly helped me think about how I can better approach not only this assessment but more assessments in the future' and 'Self-assessment generates the building blocks to improvement – I wish a lot more of my courses would utilise this self-assessment tool' (Carroll, 2013)

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Apart from task-based feedback, Review provides a more personalised learning experience through ongoing access to feedback and performance from past courses. Students can run task or longitudinal self-reports at the criteria, task, course, year and Program (degree) level.

Student access to personal, systemic, cross-course, longitudinal mapping of their achievement from criteria / task marks to higher order skills is rare in the Higher Education sphere. This encourages students to take a Program view of learning and the formation of professional skills and attributes. Essentially, this represents the ethos of ‘inclusive’ design in this assessment feedback system, where learner needs are as central as institutional needs.

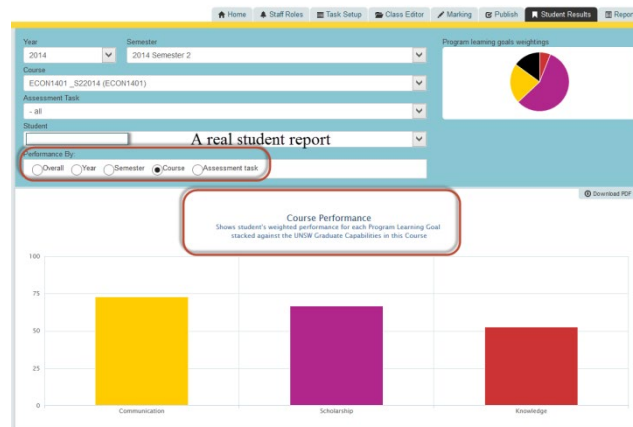


Figure 1. Student self-generated course report

Affordances for staff

As a direct marking system, Review's requirement for using criteria supports the embedding of our University's policy on standards-based assessment. Legacy practices persist, but the demonstrated efficiencies are persuading staff to adopt a systems based approach based on sound pedagogical principles. The visual, intuitive, online marking interface improves the experience of marking and of giving and getting feedback.

Table 1: Review marking affordances

Marks administration	Marking practices
Connects with central course enrolment provisioning	Criteria focus frames judgement / assist markers / motivates students
Restorable tasks and courses	Fast intuitive marking interfaces – reduces marking time
Reusable comment library banks	Self-assessment focuses students on task
Works with tablet voice to text marking in library	Allows feedback from students
Assists marker standardisation processes and feedback quality monitoring	Reusable comment library banks
Assessment dashboards	Shared online real time access for marking team
Banks of data and graphical reports	Works with tablet voice to text marking in library
Speeds course marks finalisations process	Accepts task and individual feedback file attachment
Longitudinal access to centralised records	

The required step of defining criteria to students provides a judgement frame, which shows novice learners what an expert values and judges on, in a discipline context. Academics report that this step assists them with subsequent marking. In addition, marking on a scale, delineated by the familiar grade performance markers, focuses markers on the student performance 'level of quality' against individual criteria and the overall task. System settings hide raw numbers, so markers are encouraged to consider quality – not assign marks.

Marks lie behind the judgement made on criteria and overall marks sliders. Criteria and overall judgment sliders can be balanced (Figure 2). Use of sliders is intuitive, requires little training but pays immediate efficiency dividends. The marking decisions are editable, and provide rapid visual feedback on the judgement (black triangle), student marks estimates (blue), the average mark of the cohort (grey) and auto-totalling, eliminating manual calculations and error.

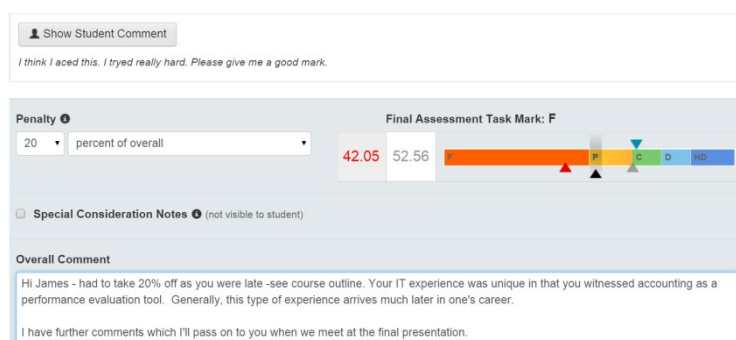


Figure 2. Overall marking and comment feedback box

The Comment Library feature (Figure 3) accelerates the provision and ongoing improvement of quality feedback. The ability to share, edit and reuse a marking team's real-time and historical feedback promotes a positive marking culture of sharing and improvement and alleviates marking stress. Staff can view, share, edit and improve colleagues stored library feedback, encouraging a 'virtuous cycle' of continuously improving feedback to students. The experience of giving written feedback, too often an isolating, repetitious and dispiriting feature of academic responsibility, is transformed through the affordances of online marking banks and collegiate input.

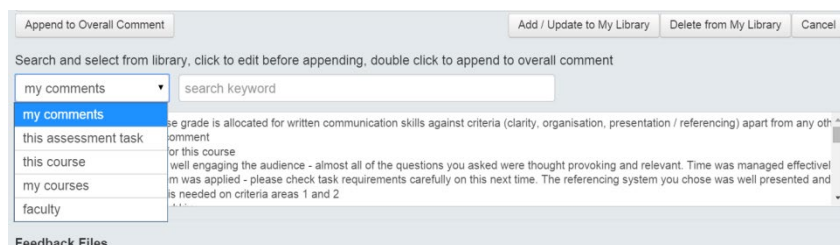


Figure 3. Comment Library

Course assessment administration is assisted via a range of visual 'home' screens. These include heat maps of student achievement at the criteria and task level and banks of online reports (Figure 4) that facilitate monitoring marking progress and outcomes. Improved in-built course assurance processes catch problems (e.g. inconsistent marking standards in team

marking). In summary, these processes have a range of beneficial effects. We have observed improved marking speeds, a concentration of marking processes, reports of improved feedback quality, easier marks assurance, more efficient course administration. Our conclusion is that the use of Review has resulted in a greatly enhanced staff and student experience of assessment.

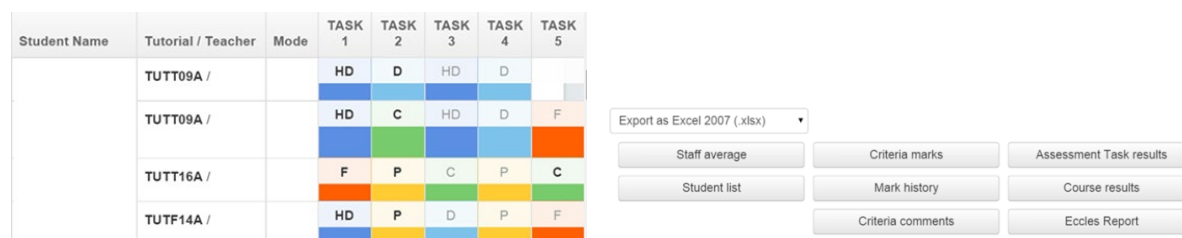


Figure 4. In-built Task Performance Heat Maps and Course Reports

More extensive evaluations of Review's impact are planned, but early evaluation rounds have drawn positive responses from UNSW academics. A 2012 Faculty staff survey reported substantial marking time savings averaging up to 20% (UNSW, 2012a). Comments included:

'Review improves marking efficiency and helps me moderate and benchmark my tutors' marking more easily ... criteria-based feedback has reduced my post-assessment correspondence with students.' Gigi Foster, Lecturer.

'Feedback from tutors has been overwhelmingly positive ... it has elevated the reliability of their work and cut the time that is required for giving feedback.' Sallyanne Gaunt, Lecturer, UNSW.

However, the most positive indicators of success are uptake: from a start point in four trial courses in 2011, year on year provision of Review into courses has grown and to over one hundred courses per semester.

Affordances for Faculty / University

We have described above how Review provides a platform that supports learning, enables better described assessment, improves marks administration and the 'experience' of assessment. Its organic growth at UNSW has been driven by the inbuilt affordances for students and staff. Staff 'buy-in' to this assessment system has grown in a way that many top-down, compliance-motivated assessment systems struggle to achieve.

Analytics for course and program assurance reporting are provided through the inbuilt querying interface. Bottom to top data mapping, allows course task data to be meaningfully represented at a variety of levels, including being 'rolled-up' to Program or university graduate attribute levels (Figure 5). The data is course assessment data, intimately connected to our core business and evidence of how we foster learning and student professional development. This approach improves the 'vision' of Schools, Faculties and the university into student, course and program performance with more meaningful and granular data. Program Directors in the UNSW Business School regularly run course and Program reports to analyse

performance as part of the ‘closing the loop’ assurance process and work is proceeding on extending and automating these reports processes to course and task levels.

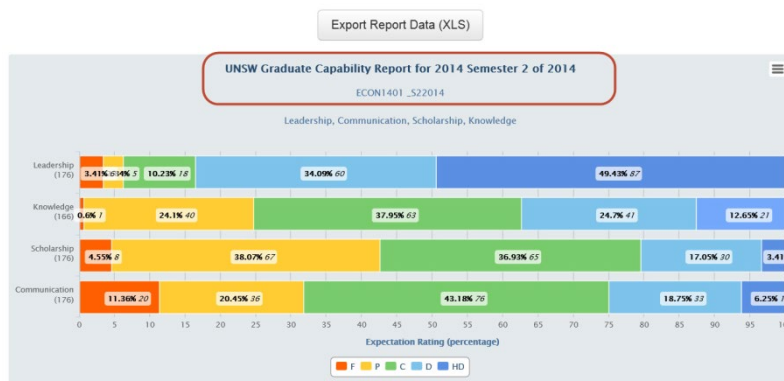


Figure 5. Program (Degree) and University Graduate Attribute Reports

Review supports our university’s policy on embedding standards based assessment in an integrative way across the institution. The widespread use of a system that systematises good-practice around explicit description and processes in assessment, while supporting learning and improving efficiency and quality, is changing teaching practice in a research-intensive, research focused environment – for the better!

Finally, let’s not forget what this is all about – better learning experiences for our students. As assessment directs and drives learning, we have to design holistic assessment systems that support improvements in the experience of assessment, the associated learning and development of self-regulating, professionally oriented graduates.

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10 KEY CRITERIA TO MANAGE AND SUSTAIN E-FEEDBACK IN WRITTEN ASSIGNMENTS

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Summary

This paper proposal contributes research evidence to help unravel how to sustain and maintain online formative feedback in online learning environments from a dialogical perspective (Nicol, 2010; Beaumont, O'Doherty & Shannon, 2011; Carless, 2013). Feedback is not a static action of providing support to the learner in one direction; on the contrary, it is a complex process that includes how the feedback is received and utilised by the learner. Following Dysthe, Lillejord, Vines and Wason (2010), feedback is defined as a loop which includes the process of giving or delivering feedback (by teachers and/or peers), processing it and implementing it in an improved product. This paper will present different strategies focused on feedback when developing written assignments. It will suggest how to design, deliver and provide feedback to learners in online learning environments in order for feedback to become an effective support which contributes to implement changes into the final texts and consequently to students' learning.

In an online learning environment or in a technology-enhanced environment (TEL), the teacher/instructor and the learner usually do not share the same time and space; therefore, the process of providing support can become more complex and so feedback needs to have specific characteristics to ensure that it is effective for the learner and that it contributes to their learning. The following figure shows the dialogic approach of feedback (see Figure 1). This feedback loop is understood as a dialogue between students and teacher, who are in a continuous online interaction. Carless, Salter, Yang & Lam (2011) define the characteristics of sustainable feedback as practices that promote "dialogic interaction usually incorporating both peer and lecturer critique" and enhance "technology-assisted dialogue with the aim of promoting student autonomy and reflective interaction" (p.404). The first phase -giving feedback- refers to how feedback is delivered. The second phase -processing feedback- refers to what actions students do with the feedback received (they can perform cognitive activities, metacognitive activities, etc. It also includes feedback comprehension and assimilation). The third phase of the loop refers to feedback implementation, which is performed by the decisions students make and the changes they introduce into a learning product, based on the feedback received in order to improve it.

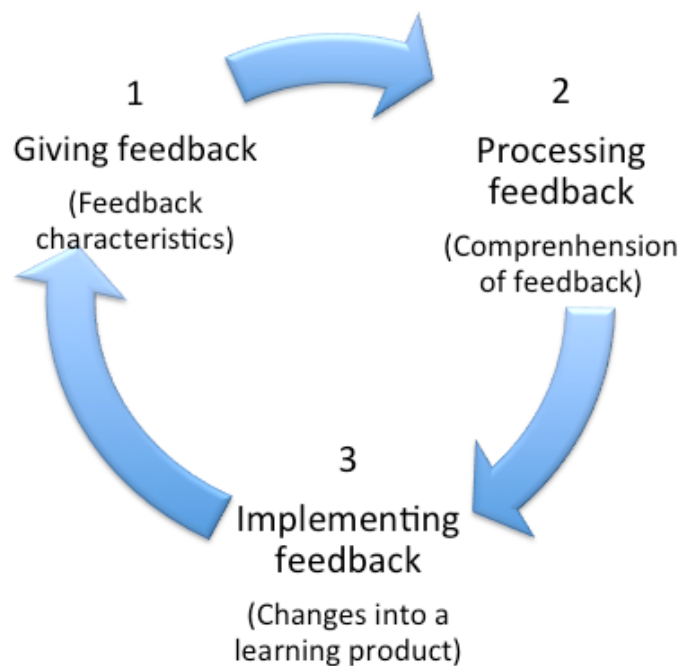


Figure 1. Feedback loop (Guasch & Espasa, 2015)

From this feedback perspective, our research team – EdOnline Research Group – has focused its activity along two main lines: i) in *terms of research*, it has led different research projects with the aim of gathering evidences on how feedback should be delivered and what should be the feedback content in order to become the most effective in the learning process (Guasch & Espasa, 2015; Espasa, Guasch & Alvarez, 2013; Guasch, Espasa, Alvarez & Kirschner, 2013). ii) *In terms of teacher training*, EdOnline Research Group has transferred its research results to online teachers' practice. Both lines of this research group are contextualised in online learning environments. These are typically asynchronous, i.e. teachers and students do not share the same time or space and, therefore, the learning process is based on the development of written assignments (assignment-based), such as essays, study cases, etc.

This proposal is focused on the latter characteristic and presents preliminary results of the four editions of a teacher training action for university teachers on the topic of feedback processes in online learning environments. The results obtained allowed us to define the key criteria which should be considered when designing, processing and implementing feedback for written assignments in online environments.

Methodology

Sample

A training action was carried which consisted of a virtual hands-on workshop addressed to lecturers from all the Faculties of the Open University of Catalonia (UOC), a fully online university since its foundation. The participants were 113 university teachers, each an expert in their subject area, and with experience in online university teaching.

University teacher' needs were taken into account from previous surveys to design the workshop. It was a 1 ECTS workshop coordinated by two trainers who worked collaboratively throughout the process. The online workshop was carried out four consecutive times (2010 to 2013) and in all the editions the same design was kept and the same teachers coordinated the activities.

Design and procedure

This study was based on the study case method (Sharan, 1998). The case we refer to shows a typical teacher training experience to develop competencies which enable the teacher to design and give feedback in virtual learning environments. The assignments devised essentially respond to the principles of learning based on authentic tasks, learning which is guided, collaborative and constructive, i.e. learning by doing. The workshop had three main assignments: in the first one, participants had to explain how they give feedback to their students and to contrast it with their peers and with two articles provided by the trainers. This task had the aim to identify what they already do well and what they could improve when giving feedback. Participants had to submit a document explaining what they thought they were already doing well and what they thought they should have done differently or could improve. In the second assignment, participants were asked to work in small groups (4-5 per group) and they had to choose one assignment with the feedback provided to their students and analyse it based on the previous tasks carried out on the workshop. The aim was for them to discuss an example in groups and design new approaches, or methodologies to contribute to students' learning. In the third assignment, co-evaluation was performed between the groups so that the participants learned other examples or approaches to designing and giving feedback, and became critical with the analysis of other proposals.

To collect information different techniques were combined so that the data could be contrasted from different sources. First, an online survey was administered to the students to find out about their previous experiences about designing feedback in online environments, particularly in relation to writing tasks. Secondly, participants' interaction in the groups was recorded to understand their difficulties in order to design and give feedback; this task was developed in each group. We also collected the learning products submitted by participants in the first assignment. Finally, participants had to answer a satisfaction survey.

This study is focused on the analysis of the learning products submitted by participants in the first assignment of the course. A content analysis of the documents was carried out from an inductive perspective identifying the topics related with how feedback should be in order to contribute learning. The data analysis is based on a previous study (Álvarez, Espasa & Guasch, 2011) taking into account different dimensions, such as the planning process of designing the feedback, the nature of feedback, its function, the medium to provide feedback, and students' use and implementation of the feedback. This analysis will be explained in a longer version of the paper.

Results

From a triangulation of the different data sources, we can summarise ten key criteria which cover the whole loop of “giving or delivering-processing-implementing” feedback. Examples of the strategies will be presented in order to scaffold their implementation into the teaching practice in TEL or online learning environments.

10 key criteria to sustain and maintain online feedback in written assignments:

1. Planning feedback. In the design and planning stages of teaching and learning in online environments, planning feedback becomes especially important. Such planning involves making decisions about the feedback’s form and content, but also about the timing and nature of activities that would help promote students’ participation, monitor their progress and provide suitable support (feedback) accordingly. If these interventions are not pre-planned, feedback is less likely to take place and would only happen at the end of the learning process, once the students have submitted their work. Therefore, we believe that only by monitoring the students’ learning process will we be able to implement truly formative assessment.
This planning would need to take into account the various element of the feedback loop (giving feedback, receiving and processing feedback and implementing feedback).
In planning feedback, actions to address the following criteria would need to be considered:
2. Timing feedback: feedback should be given when the students are working on their assignments and also once they have submitted it.
3. Matching feedback to aims: feedback should be delivered taking into account the learning aims.
4. Shaping feedback content: Feedback content should include both verification and elaboration components (i.e. corrections and suggestions and/or epistemic questions).
5. Personalising feedback: feedback should be tailored to student’s needs.
6. Implementing feedback: from the planning stage, some activities should be proposed in order to ensure that students have processed feedback and are willing to introduce changes in their written assignments.
7. Delivering feedback: feedback should be delivered by the teacher, a team, a peer, a technological system, an external expert or by the students themselves. Depending on who gives feedback, some strategies are identified:
 - Co-assessment or peer assessment: students take part in the assessment process, giving and receiving feedback to each other.
 - Self-assessment: students monitor their own assessment process comparing their assignment to a model assignment.
 - Using rubrics for giving feedback.

8. Choosing the feedback medium: you should decide which medium you will use to deliver feedback: audio, video, written (with comments into the text, sending an email, etc.).
9. Promoting interaction -feedback as a dialogue: you should promote interaction and collaboration among students and between students and teacher to facilitate the processing phase of the feedback loop.
10. Designing feedback for self-regulation: feedback given should be oriented to enhance self-regulation of learning.

Some of these criteria are referred to the first phase of the loop, other should be taken into account when students receive and need to process the feedback received and other criteria are related with the implementing phase. Therefore, the criteria identified cover the whole loop.

It is worth mentioning again that these criteria have been designed taking into account the results from previous studies but also integrating the difficulties expressed by teachers. Some of these difficulties revolve around providing personalised feedback in online environments with a large number of enrolled participants or with few evidences of what the students are doing with the feedback delivered. In this regard, the aim of this paper is to provide strategies that contribute to students learning but without adding to the teachers' workload.

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360° E-ASSESSMENT: AN ONLINE COLLABORATIVE PROCESS IN THE SCENARIO OF THE OPEN UNIVERSITY OF CATALONIA (UOC)

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Introduction

The incorporation of Information and Communication Technologies to learning processes promotes a reconsideration of assessment systems, fostering a change of the teacher's role as a communicator of the student's mark to that of an open system in which teachers and students get involved in the learning process and develop online assessment skills.

Based on the theoretical principles of assessment in virtual environments, this paper approaches e-assessment (Rodríguez Gómez, 2012), defined as any assessment process in which ICT is used in order to introduce and carry out assessment activities and tasks, register the answers and evaluate them from different perspectives: learners, teachers, institutions (JISC, 2007). The variety of applications of e-assessment and its innovation and efficiency reaffirm its potential as a booster of the learning process and learner outcomes (Open University, 2006)

The experience presented in this paper focuses on the subject "ICT competencies" (ICTC) which is part of all the UOC university programs. This subject helps students to develop key methodologies and skills to work in digital environments from a rational and critical perspective, and its objective is that students begin in a gradual and integrated way with the acquisition of transversal competencies at the UOC; "Use and application of ICT in an academic and professional environment" and "Online team work" (Guitert et al., 2008). The methodological approach is project-based learning (Railsback, 2002), concretely, the developing of a collaborative digital project is contemplated. To undertake it, students form groups of four, and have their own group space which integrates a variety of tools.

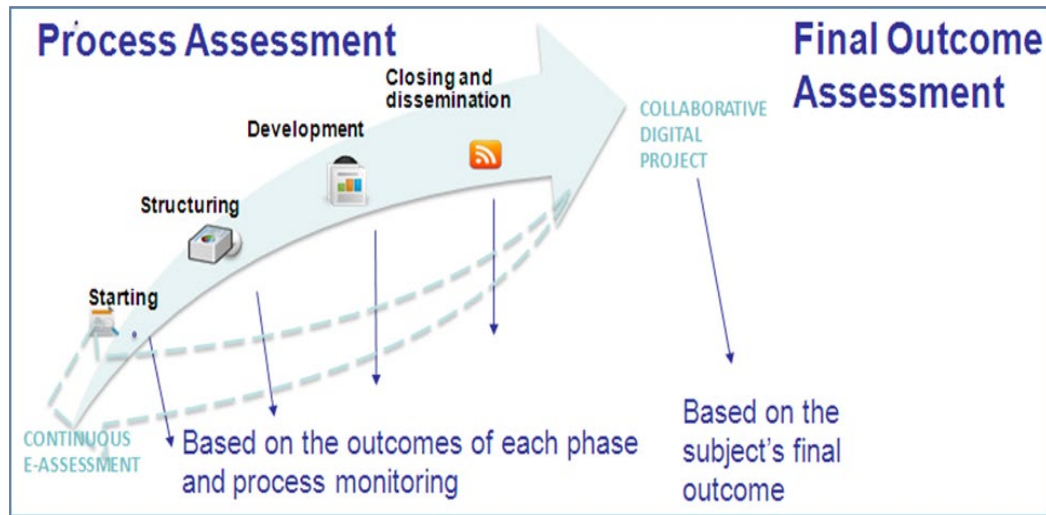


Figure 1. Phases of the Collaborative Digital Project and e-assessment processes

As shown in Figure 1, the development of the project is planned in 4 phases: (Starting, Structuring, Development, and Concluding), and a set of interrelated activities is put forward for each one.

The starting phase provides an environment to create working teams and perform the initial searches. This assists the students in setting out the theme of the project. The second phase involves making a deeper search for information to structure the project. Subsequently, the project is developed: the processing and the development of the gathered information are carried out. Through this step, the first version of the project is achieved. Finally, the closing and dissemination of the project are done, as well as the sharing and discussing of the final version of the project. In order to assess the acquisition of the competencies during the subject's development, some assessment criteria were defined and shown in the learning activities.

In fact, student learning is assessed from two dimensions provided by the continuous assessment paradigm: on the one hand, based on the analysis of the process followed during the development of the activities and, on the other hand, based on the final outcome (Figure 1).

The fact of developing a digital project collaboratively facilitates the implication of the students not only in their individual learning process but also in the collective learning process. This is further corroborated when the definition of collaborative work is defined as a “shared, coordinated and interdependent process, in which students work together in order to achieve a common goal in a virtual environment and based on a process of activity, interaction and reciprocity between students, thus facilitating the collaborative construction of meanings and individual progress towards reaching higher levels of development” (Guitert & Pérez-Mateo, 2013, p.24).

This scenario boosts the development of a new teacher's role as an advisor and facilitator of the learning process (Pérez-Mateo et al., 2012), providing a more active role of the students through reflecting on their own learning process and peer assessment.

Considering this perspective, the concept of 360° e-assessment can be formulated from the bases of the 360° Communication, which is “considered as a state of constant dialogue in which organizations take on a Communicator role with their clients (internal and external)”, so it becomes a comprehensive strategy that connects companies constantly with their public, online and offline (Lopez & Martinez, 2012) Based on the 360° communication theory, 360° e-assessment can be defined as following (Curcoll, 2014):

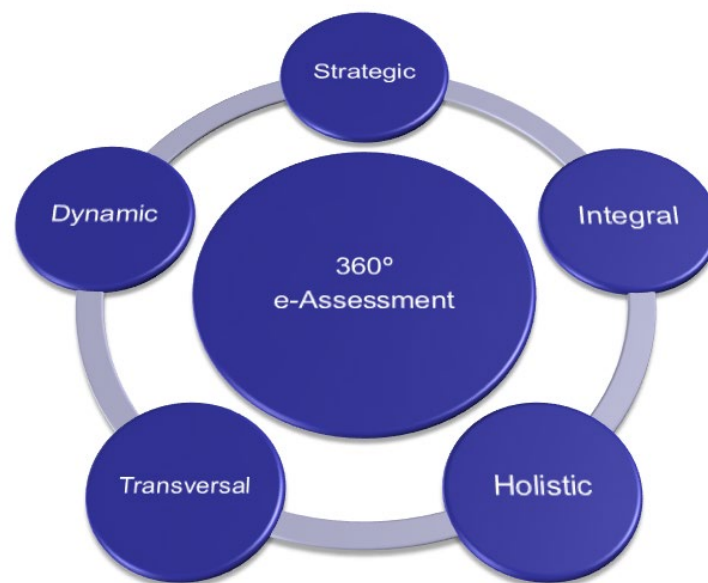


Figure 2. 360° e-assessment definition (adapted from Curcoll, 2014)

- Strategic: considering the totality of the learning experience and competency acquisition,
- Comprehensive: seeing the learning space as a live, changing and dynamic system that affects all of the agents of the teaching and learning process,
- Holistic: takes into account all the internal agents – understood as work groups- and external – the whole classroom- in order to understand collaborative learning as more than an addition of several parts,
- Transversal: it affects all of the learning actions and activities and the interactions that take place during the learning process,
- Coherent: it coordinates and gives sense to the whole teaching-learning process,
- And dynamic: it conceives assessment as a constant interaction process among students and between students and teachers that can be redefined depending on the inputs received.

Following this definition, the aim of 360° e-assessment is to reinforce and motivate the students' learning process in order to help them to acquire the competencies of the ICT competency course.

Typologies of e-assessment in the 360° paradigm

Having defined the changes of the roles of the teacher and student during the process of learning assessment (teacher-students-group of students) and the new scenarios of collaborative learning, different types of assessment can be considered in the 360° paradigm:

Table 1: Typologies of the 360° e-assessment paradigm

	Process assessment	Final outcome assessment
Teacher	Assessment of the process of the groups followed during the learning activities. Student's self-assessment is taken into account in the assessment process carried out by the teacher. Individual and group feed-back.	Result of the assessment based on the analysis of the outcome of each phase of the digital project using the assessment criteria shown in the learning activities.
Student	Self-assessment Peer-assessment Reflection about the teamwork at the end of each phase.	Dialectic assessment based on the analysis of the projects of other teamwork.

From the teacher's perspective, a process and final outcome assessment are carried out. The teacher monitors and assesses the work developed in each of the groups during the process in order to improve their dynamics. During this assessment, the active role of the students is quite relevant, since the self-assessment they develop in each phase of the digital project is one of the elements that determine teacher's post-assessment of their work.

The process assessment is finished with both individual and group feed-back: individual feedback is based on the observation of the participation of each student within the group and the group one is based on the monitoring of the group's dynamics and processes.

In the assessment of the final outcomes, the teacher assesses the final product of each phase following the predetermined criteria shown in the learning activities. This assessment is developed using a set of indicators that are a concretion of the afore-mentioned assessment criteria.

From the students' perspective, both the assessment of the process and the final outcome are carried out as well. The process assessment, is produced in a **self-assessment** process in which both the student and peer participation in a work group are analysed, developing a dynamic **peer-assessment**. In addition, a process of reflection about the teamwork is carried out at the end of each phase of the project.

The assessment of the results focuses on a **dialectic assessment** based on the analysis of the projects developed by other groups at the final stage of the course. During this phase, a defence process takes place during which every student participates individually as an evaluator and as part of a group participating in the elaboration of the responses that their specific group receives from other individual evaluators.

The active participation in the assessment process provides students with an awareness of their grade of competency acquisition, thereby allowing them to be an assessment agent of their own learning process from different perspectives or dimensions. In consequence, e-assessment becomes, within the ICTC's subject framework, a very valuable resource to foster students' implication in their own learning, from both the individual and collective perspective. In addition, the consideration of this dual perspective provides a higher level of personalization of student assessment: each student of the same team can obtain different marks according to the quality of their individual work in the framework of the team. In this situation, the e-assessment process can become a network assessment process (Figure 3):



Figure 3. Representation of the network assessment process
Retrieved from <http://cambio-de-vidaa.blogspot.com.es>

Conclusions

The continuous development of assessment activities from different perspectives becomes a validation process in itself. The carrying out of collaborative activities in digital environments “facilitates the gathering of evidence of the interactions and the process of a shared construction of knowledge” (Guitert & Pérez-Mateo, 2013). In that sense, the realization of an online assessment process allows teachers to triangulate assessment from the evidence registered in the common spaces of the online environment, fostering the individual assessment of both the process and the final outcomes, based on the participation of all the afore-mentioned agents.

The 360° e-assessment paradigm boosts students' active role during their learning process and provides the following advantages:

- Teacher feedback helps students to understand and promote their learning process,
- 360° e-assessment helps students to be more aware of their acquisition of competencies through self-assessment,
- Peer-assessment processes promote the objective assessment among group peers,
- It allows students to improve their individual activity in the framework of the group,
- It helps students to improve their products during the learning process. It reinforces group dynamics and the relationship with peers through both reflection and discussion processes,
- The dialectic assessment developed at the end of the course has two clear advantages for the students:
 - The assessment of other projects promotes the critical analysis of students' own projects,
 - The assessment received from peers of students' projects helps them to detect their own project's weaknesses.

In conclusion, what provides the 360° vision to e-assessment is the fact that it is carried out collaboratively and each student has an important role in both self and peer-assessment processes. In order that this collaboration becomes authentic, it is necessary that all of the participants show some attitudes like those of constant participation, periodicity in communication, commitment and transparency. In addition, it is a great resource to improve online teaching and learning processes.

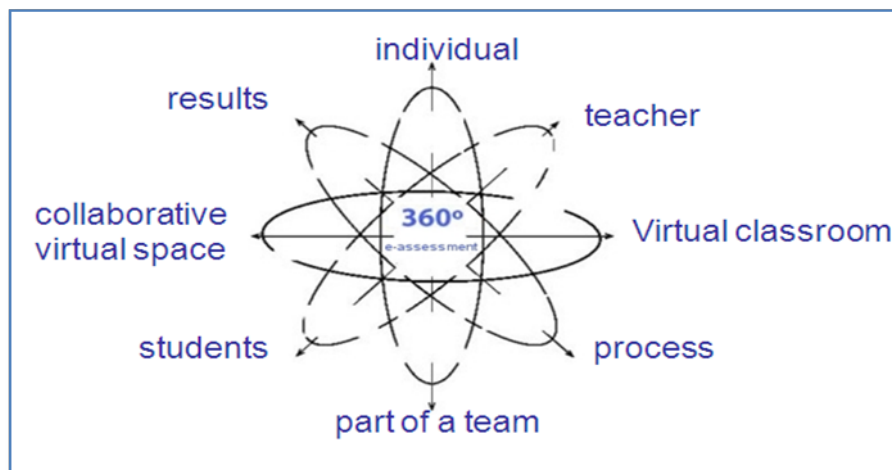


Figure 4. 360° Vision of e-assessment adapted from Curcoll (2014)

The 360° e-assessment proposal presented can be transferable globally or partially to other contexts depending on the grade of implication of the different actors in the learning process.

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MEASURING A CRITICAL IMPACT ON TECHNOLOGY IN EDUCATION: A TOOL FOR OERS EVALUATION

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The context

This paper is part of a wider research project and focuses on the model adopted for evaluating the impact and effectiveness of online teaching and learning, enabling students to adopt a critical approach which could be extended to any online resource which they may use for their lifelong learning. Otten and Ohana, in their *The Eight Key Skills Competences for Lifelong Learning* (2009), a document issued under the support of the EC DG Education and Culture, focus on the identification of a set of skills needed to overcome present youth unemployment and social exclusion in developed countries. The central concepts referred to are: “critical thinking, creativity, initiative taking, problem solving, risk management, decision taking and managing feelings in a constructive manner” (p.10). There should be a closer connection between the above skills, education and digital education in particular. Technology plays a fundamental role in everyone’s life and must be approached critically, especially by young people entering the labour market for the first time. In the information society, the amount of online content is constantly increasing, and more content is becoming readily available online. Open Educational Resources (OER) are assuming an ever increasing importance in national educational policies. Between 2005 and 2007 UNESCO identified priorities for the spread of OER (OECD, 2007).

The Laboratory for experimental pedagogy (LPS) based at the Department of Education – Roma Tre University has been working, since 2010, on research focusing on the enhancement of students’ critical thinking skills to foster the development and promotion of the critical use of technology in education. A series of departmental projects, coordinated by LPS researchers, have been funded from 2011 to achieve these aims (Poce et al. 2011; Poce, 2012; 2014a). The projects use specific models and coordinated approaches to teaching and learning across a range of disciplines. Students are invited to engage in learning activities, which involve analysis and reflection, individually and in groups, taking into considerations the differences in learning, according to the specific situation. Students work on the different tasks focusing on the identification of cultural and disciplinary contexts, within the *lectio magistralis framework*:

1. *Distinctio* – presentation of the context;
2. *Divisio textus* – analysis of the text;

3. *Collatio* – discussion;
4. *Quaestio* – critical interpretation.

The same analytical method is used on a variety of texts, including Descartes and Rousseau, working online on a dedicated platform. The main aim of the study has been to provide students with the opportunity to approach online learning in a structured way, which can be applied in a variety of contexts.

This paper describes how giving students the tools to carry out an evaluative analysis of the resource they are accessing can enable them develop their analytical and critical thinking skills. It can also help them to gain insight into the importance of ‘learning to learn’. These students also gain the ability to characterise the impact of OERs on Higher education teaching and learning. The main scope of the present research project is that students could independently evaluate the quality of online digital resources both as learners and future educators. Doing so it is possible to overcome “brief term instrumental characteristics” of tools and promote long term evaluation processes (Vertecchi, 2012). This proposal concerns an area of research into distance learning which has not been explored in this way previously. The study does not explore the quality of learning in online environments. Rather, it investigates how students should approach the online resources at their disposal, facilitating their critical and reflective skills and adopting a model for analysis.

Hypothesis research questions and objectives

Taking into consideration national and international literature, the wider project, where this study is set, aims to design and test a new evaluation system of open access multimedia educational products, such as the one students experienced in the course of Educational Research Methodology – Università Roma Tre. The goal is to identify tools which enable the user critically to evaluate online resources and their impact on Higher Education teaching and learning.

The research tests the following hypothesis: Students who use a specific system to evaluate the quality of OERs are able to deepen their understanding of online teaching and learning in higher education and acquire sharper critical and analytical approaches to the evaluation of online learning.

Research objectives are the following:

- to define an innovative system for the evaluation of OERs;
- to define new quantitative and qualitative indicators to evaluate the impact of OERs on Higher Education teaching and learning;
- to give students, as learners and future educators, quantitative and qualitative tools to freely assess a range of open access online resources;
- to teach students contents about entrepreneurship education, as described, later on, in the specific example.

As mentioned above, here the focus is limited to the tool for the analysis of the effectiveness of specific examples of OERs.

OERs description

The OERs under investigation were created to integrate face-to-face teaching and learning within the pre-service course of Primary Education based at the university Roma Tre. On a dedicated platform, two lectures, on some passages taken from Rousseau, *Émile, ou De l'éducation* (1762), were podcast. These lectures were organised by reproducing a model that proved successful at Bologna university in medieval times, and has been replicated in different contexts, including today's. Each passage was presented taking into account the following phases:

1. *distinctio*, presentation of the subject (by introducing the context, the author, the setting of the work)
2. *division textus*, the analysis aimed at understanding the constitutive elements of the text
3. *collatio*, a discussion of the pros and cons between students and the tutor
4. *question*, the text, following the analysis and the group/tutor discussions, is subject to a global and critical interpretation

In the case of the project all the information mentioned in the first phase were related to Rousseau and his work *Émile, ou De l'éducation*. The second phase consisted in recording reading and commenting on the Preface and Book I from *Émile, ou De l'éducation*. The third phase was carried out facilitating online discussion on the issues raised by the readings. In order to accomplish the final phase, as a last assignment, students were asked to produce an essay to be written collaboratively online.

Methodology

More than 200 students, attending the master (pre-service) level university degree in Primary Education – Roma Tre University, were involved in the research, on a voluntary basis and all of them participated actively in the task and filled in the evaluation questionnaire being piloted. Students participated in the online lecturing, as part of the compulsory module in Educational research methodology (6 ECTS), after approval of the Primary Education degree course governing body. The task formed a compulsory curriculum module, which contributed to admission at the final exam. After taking part in the course, they had to carry out an evaluation, according to the *ad hoc* model devised by LPS researchers and described below.

The complete methodological plan was the following:

- Students' background variables questionnaire administration;
- OERs completion;
- Evaluation form, defined according to specific indicators created to assess the impact of OERs on Higher Education teaching and learning;
- Final questionnaire on the experience.

The evaluation form can be considered an innovative qualitative research tool, based on specific indicators to assess open access multimedia products, like OERs. It was realised by adapting categories taken from the model for the assessment of critical thinking skills by Newman, Webb and Cochrane (1997). It, therefore, represents a tool which analyses the characteristics of OERs with reference to those generic competences which are increasingly demanded by the labour market.

The questionnaire is divided into four sections:

- The first is devoted to Newman et al. (1997) categories of *relevance* and *importance* and contains indicators linked to formal characteristics of course content (e.g. comprehension, feedback effectiveness, video lecturing length and so on).
- The second section is related to the categories of *breadth of understanding*, *argumentation* and *justification* and consists of a series of statements. Students indicate how far they agree with the statements using a five point Likert scale. The statements focus on issues such as level of understanding, step by step learning, growing difficulty, lack of information and explanation, etc.
- The third section is devoted to *critical evaluation*, as students were asked to critically assess content, proposing issues for discussion and reflection, according to The Eight Key Competencies for Lifelong Learning (2009). Questions, here, were related to self-assessment of the competencies acquired.
- The last section was designed to identify *novelty*. This is the only open ended section. The aim is to enable students to reflect and express their own opinion/evaluation, adding elements on already identified indicators (e.g. “briefly describe strengths of the course you participated in”; “briefly describe weaknesses of the course you participated in” “how could the course be improved” and so on).

Some Results

Some results regarding one of the OERs attended by Roma Tre Education students are presented and commented on below.

Findings presented here are mainly related to the employment of the evaluation form (questionnaire), because, according to the research group that carried out the work, it represents an innovative tool for investigation and it could be employed to evaluate the impact of various technological instruments used in education and training. A first try out of the tool was carried out in the academic year 2013/2014 and regarded the evaluation of three MOOCs prototypes attended by a small group of education students (30 individuals) based at Roma Tre university (see Poce, 2014b). The present analysis instead is concerned with a larger number of attendees and wants to be a more significant test-bed. The following paragraphs highlights main results.

Data from the first section of the questionnaire in this case highlighted that content was easy to understand, correct, effective, complete and quality of design and presentation were judged very positively. Feedback given to the students was also judged very positively by more than

the 80% of the respondents. Almost 80% of the students rated very positively or positive the variety of multimedia didactic materials. More than 40% of the respondents rated on the average (3) the difficulty of the assessment tests carried out during the course. A similar percentage rated high this difficulty (scores 4 and 5) and only 14% of the students evaluated the tests too much simple to answer.

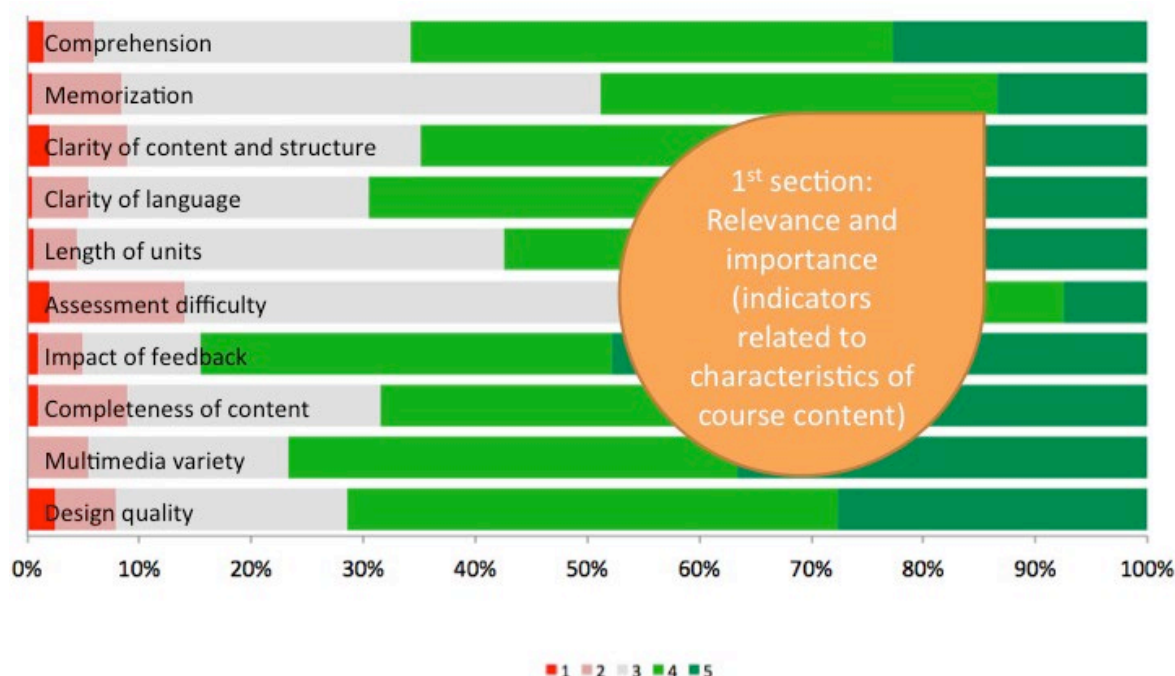


Figure 1. Quality Evaluation – *Relevance and importance* (indicators relate to characteristics of course content)

As regards breadth of *understanding*, *argumentation* and *justification* general evaluation was positive: more than 80% of the students strongly agree or agree with the statements “I learnt what I expected”, “I learnt step by step (growing difficulty)”, and more than 50% strongly agree or agree with “The course raised my curiosity and I deepened some topics”.

They do not agree, with negative statements, highlighting how the quantity of information was adequate and analyzed correctly.

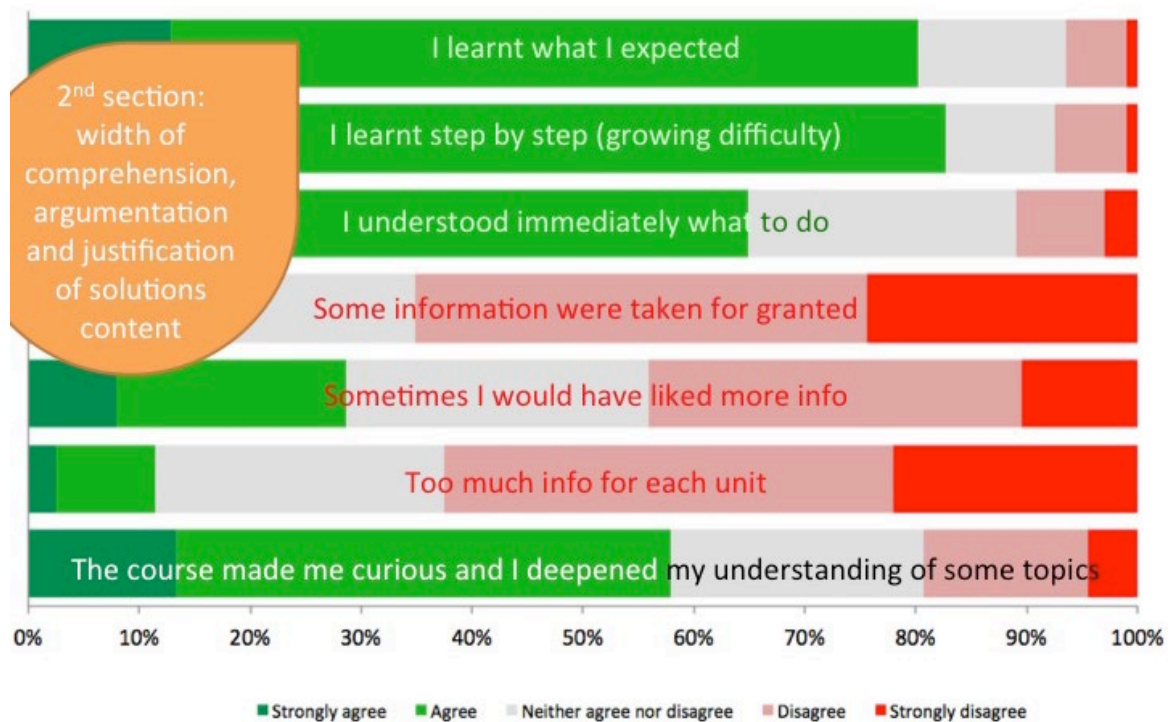


Figure 2. Content Analysis – Width of comprehension, argumentation and justification of solutions content

As far as critical evaluation is concerned, it is critical thinking, followed by communication, research design ability, memorizing, problem solving and creativity, the most chosen option. The course subject, readings from *Émile, ou De l'éducation* by Rousseau, had a strong influence on the acquisition of the skills under discussion. As expected, entrepreneurship is considered less involved in such sort of learning processes.

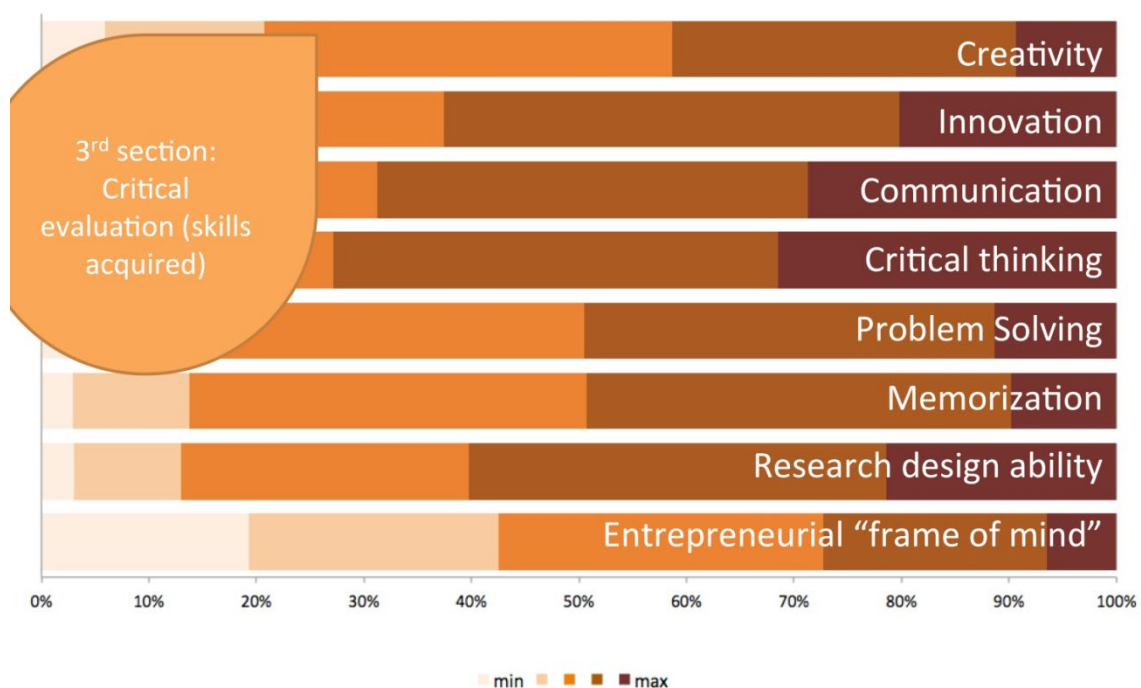


Figure 3. Critical evaluation (skills acquired)



Figure 4. Tag cloud – Open ended contributions (Italian)

As regards open ended questions, a semi-automatic lexical analysis has been conducted considering the raw frequency of the lexicon gathered from the answers. It was visualized in a tag cloud (Figure 4) excluding Italian language common words of all the terms used in the question. More precisely, it has been asked to the students to identify course strengths (in Italian language ‘punti di forza’) and weaknesses (‘punti di debolezza’) so these words were not considered in the analysis. As expected, a vast amount of nouns were used by the students. In scattered order: course, platform, work, teacher, lesson(s), activity, clarity, possibility, information(s) and video. Reading the answers given, the last term ‘video’ appears to be strictly related to the students’ quality evaluation, more precisely with the ‘multimedia variety’ value. It appears that the students loved to watch multimedia presentation of didactic materials.

Conclusive remarks and further research

The aim of the present contribution is to report on the evaluation system, as well as on the evaluation products devised and obtained through this research, which represent, as a whole, an innovation in the field of distance education, in general and in Higher Education, in particular. The above system has been already tested on a previous preliminary research (Poce, 2014b), which already highlighted the effectiveness of the model, even if tested on a small number of cases.

Promotion of OERs is growing in different forms and settings, showing their wide educational potentialities. Actually, the same wide spread and openness, which characterize them, raised high standard methodological, evaluation and qualitative issues to be faced.

The project described here helped to define a system, which tends to match the intrinsic characteristics of OERs (widespread and openness) with those generic competencies, increasingly demanded by the labour market (critical thinking skills, in particular).

The LPS – Roma Tre University research group will carry on with the development of the evaluation tool and will extend the application of the system to other contexts and environments, as it happened with the experience reported here. The Department of Education – where LPS is based - has funded another term of experimentation, which will take place in the second term – year 2014/2015.

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Authors

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REALIZING THE POTENTIAL OF COMPETENCY-BASED LEARNING AND BADGES

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Though not new, competency-based learning (CBL) has recently captured the attention of the education community—and for good reason. When millions of people have been unable to attain credentials while juggling work, families, and other responsibilities, learners need flexibility in their educational opportunities. The large segment of first-generation, low income students also benefit from innovative pedagogical approaches and lower cost options, and in this arena CBL provides many advantages. However, CBL is not one specific thing, and when combined with the potential of badges and micro-credentials, it is part of a growing range of opportunities for learner-centric innovations in education policy and practice.

As part of a joint research initiative, the American Council on Education and Blackboard have generated a series of resources to foster broader understanding of CBL and how various types of CBL practices can contribute to degree completion and workforce readiness. The research deliverables include Clarifying Competency-based Education Terms: A Lexicon, CBL models, a white paper, a public forum, and a series of roundtables among CBL thought leaders.

The research is not simply describing the current state of CBL, but more importantly raising challenging questions about scalable, learner-centric approaches that include assessing learning in non-academic settings and the use of open badges to record, certify, and accumulate evidence of learners' competency achievements. The research prompts us to consider critically the role of courses, credits, and other traditional educational structures as CBL provides a different lens for understanding learning achievements, authentic assessment, evidence of learning, and lifelong learning practices. This work addresses how evolutions in policies and practices are changing the landscape of educational delivery and attainment.

Introduction

For over a century, the credit hour has been a unit of measure in U.S. post-secondary education, a recognized “currency” for educational achievement and completion of credentials. Processes built around credit hours are based on industrial-age, highly-structured, time-based educational models, presenting challenges in adapting these processes in an information-age economy that relies on greater flexibility and the ability to apply learning in rapidly changing circumstances. Recent innovations in competency-based education address 21st-century needs by focusing on mastery of competencies regardless of “seat time”, providing opportunities to reconsider how educational systems can be structured around

learning outcomes. This shift in focus can generate new “currency” based on the value of competencies among stakeholders in our educational ecosystems. This paper investigates the social, practical, and policy implications of competency-based education and how credits *and* competencies both reflect important structures of value for diverse stakeholders: government agencies, educational leaders and administrators, faculty, assessors, students, and employers.

The “Carnegie unit” was originally defined in the late 19th century as a way of standardizing students’ high school work to facilitate college admissions (Shed, 2003). It was broadly adopted in U.S. post-secondary education as an eligibility requirement for the Carnegie Foundation for the Advancement of Teaching faculty pension system (Laitinen, 2012). Soon the “Carnegie unit” was adapted to define time-based “credit hour” units for determining faculty teaching load, as part of the standardization of educational processes and degrees in an industrial era. The credit hour was never intended to measure student learning, but over the years it accrued value as a proxy for student outcomes and as a well-understood, common unit of course and credential time-based processes.

The Carnegie Foundation as early as 1906 explicitly stated the distinction between time spent in a learning process and the learning results attained (Harris, 2002). And Ernest Boyer, then president of the Foundation, re-iterated this point in 1993 and went on to state that “for far too long education in this country has been based on seat time, not on learning ... the time has come to bury once and for all the old Carnegie Unit” (Boyer, 1993). Nonetheless, so many educational processes rely on the fixed, standardized unit of the Carnegie credit hour that a massive retooling would be necessary to use different methods of measurement.

Competency-based education programs can be designed to address these issues. Given the broad implications of federal, state, and institutional policies and practices based on the credit hour, CBE faces fewer barriers when outcomes-based approaches are compatible with credit-hour systems and processes. Federal guidelines for direct assessment and experimental sites can provide a context for more extensive future changes in our educational systems, but in the short term, the reach of these initiatives will extend to few students. Innovating “within an existing frame,” as Amy Laitinen (2012) points out in *Cracking the Credit Hour*, is also an effective approach, and one that can rapidly provide benefits for large numbers of students.

Considering these key issues, this paper raises questions concerning the broader implications of CBE and philosophical challenges surrounding the credit hour and competencies. These questions and implications are framed by illustrations of the currency value of credits and competencies in educational ecosystems.

Credits as currency

Do we need a new currency for measuring post-secondary outcomes and achievement? Credits are well-understood currency, used throughout administration, management, and funding processes among post-secondary education stakeholders. The longevity and ubiquity of credits implies tacit understanding of their value, but a deeper understanding of this value requires analysis of how it is derived and validated.

Just a few representative examples illustrate how credits provide practical value and address some critical needs of key stakeholders in post-secondary ecosystems.

- Government agencies use credits to define how financial aid is awarded.
- Educational institution leaders use credits to understand key performance indicators at their institutions, such as enrolments, progress toward degrees, and degree attainment.
- Institutional administrators use credits to manage enterprise education business processes and to track key components, such as full- and part-time student status, faculty teaching load, and the definition of degree requirements.
- Subject matter experts use credits to define the units in curriculum structures that become degree requirements.
- Teaching faculty use credits to measure their teaching load, what counts as overload, and full-time/part-time status, which applies to retirement and other benefits.
- Assessment stakeholders both inside and outside the educational institution use credits as units that encapsulate learning achievements to be evaluated and measured, both for individual students and across programs and degrees.
- Students use credits to understand degree requirements and progress toward degrees.
- Employers see credits as components of degrees and as units of measurement for tuition reimbursement programs.

The value of education, of course, goes far beyond these practical needs. The validation of credits and evaluation of how well they meet the needs of 21st-century educational ecosystems is complex and multi-faceted, emerging from shared values in communities of stakeholders. Validation requires collectively answering questions such as:

- Do the credits accurately represent the learning achievements they're designed to represent?
- To whom are the credits meaningful, and how is that meaning applied in ways that provide value for stakeholders?
- Does the provider have the authority to issue the credits?
- Has the learning represented by the credits been accurately assessed?
- Are the credits valuable in contexts other than the institution issuing the credits?
- Are the learning achievements represented by the credits applicable in multiple contexts, and what is their "exchange value" in various contexts?

Addressing these questions goes beyond the practical utility of credits in order to evaluate the breadth and depth of their validation. This evaluation is complicated by the fact that the values in our educational ecosystems are changing in response to 21st-century needs. The shift from industrial models of education to information-age innovations is exposing fissures in systems that assume the value of credits.

Representative examples illustrate how credits fail to address some critical needs of key stakeholders in post-secondary ecosystems.

- Government stakeholders: Credit-hour systems and their corresponding financial aid requirements work against students who cannot complete a degree in one stretch of time and at a single educational institution, thereby hindering degree attainment, employment, and economic growth.
- Educational institution leader stakeholders: Credits do not represent educational quality, the validity of learning achievements in multiple contexts, or the ability of graduates to succeed in lifelong learning and careers.
- Institutional administrator stakeholders: Credit systems are rigid and difficult to adapt to changes in curriculum and flexible models for degree requirements.
- Subject matter expert stakeholders: Credits do not adequately represent the complexity of learning achievements in a body of knowledge and how those achievements are applicable in multiple contexts.
- Teaching faculty stakeholders: Credits do not accurately represent the complexity of a teaching load or the investments faculty make in helping students achieve learning outcomes.
- Assessment stakeholders: Credits do not represent educational quality, and they are rather arbitrary units to encapsulate learning achievements to be evaluated and measured, both for individual students and across programs and degrees.
- Student stakeholders: Credits do not transparently represent students' learning achievements, and they are often not portable or applicable across multiple contexts.
- Employer stakeholders: Credits do not adequately represent learning achievements or what a potential employee can do.

Can competencies provide a new currency that augments the value of credits in educational ecosystems? How do competencies address the needs of 21st-century educational ecosystems?

The implications of competency-based education

Competency-based learning (CBL) models and competency-based education (CBE)¹ programs are evolving rapidly as stakeholders throughout our educational ecosystems confront the complex implications of focusing on learning outcomes.

The United States Department of Education has been taking a long, hard look at creating alternative pathways for college completion for post-traditional learners. This federal examination has led to recommendations regarding CBE programs and their value for students facing barriers to completing a college degree in the traditional manner. Federal guidance now includes structured opportunities for direct assessment and experimental sites for deeper exploration of the value of CBE². Regional accreditors have examined both their

¹ For the distinction between competency-based learning and competency-based education, as well as definitions of other terms, see Clarifying Competency-based Education Terms: A Lexicon (<http://bbbbb.blackboard.com/Competency-based-education-definitions>).

² Steps taken by the Federal government include Direct Assessment (<http://ifap.ed.gov/dpcletters/GEN1310.html>), Experimental Sites (<http://www.ed.gov/news/press-releases/us-department-education-expands-innovation-higher-education-through-experimental>), and funding incentives through the Trade Adjustment Assistance Community College and Career Training (TAACCT) grants (<http://www.doleta.gov/taacct/>).

philosophies and their guidelines regarding competency-based degree programs and credentials in order to foster innovation while ensuring quality³.

Individual colleges, universities, and even university systems have initiated programs incorporating competencies as the central focus of those programs⁴. These examples of CBE are provoking strong discussions among academics about how competencies map to their current programs and goals. Participants in the CBE movement are beginning to realize the many broad implications of these innovations, including:

- **Societal implications:** Competency-based models open up possibilities for long-needed renewal of higher education and institutional opportunities to participate in: (a) transitioning from an industrial to an information society; (b) restructuring the economics of higher education, and (c) democratizing access for underserved populations.
- **Practice implications:** Competency-based models may solve the issue of outcomes and achievement accountability with which institutions now struggle, as assessment and accountability are inherent in the structure of a competency framework.
- **Policy implications:** If competency-based systems are ultimately supported by federal and state policies to the extent of credit hour-based systems, the systems can inform each other and work against the forces of stagnation and obsolescence. If federal and state policy makers formally recognize the value of competency-based systems, this would encourage the potential for growth of CBE programs and hasten evolution of the currency value of competencies.

Philosophical challenges regarding credits and competencies as currency

One of the issues that often comes up in the debates over credit hour-based learning and competency-based learning concerns validation of learning achievements. Assuming both models employ assessments of student learning and achievement, the controversy is really about what is being assessed in each instance. To put it most boldly, what is important to validate in a student's learning experience – the amount of time put into a chunk of instruction and the student's ability to reiterate what was contained in that instruction, or mastery of a competency that is demonstrated by the student's ability to apply it in a given situation?

Of course, this binary represents two ends of a spectrum of thought about the goals of instruction, learning, and certification of learning. Few would be in agreement with the

³ For example, regional accreditors are providing guidance for review of competency-based programs: Southern Association of Colleges and Schools Commission on Colleges (<http://www.sacscoc.org/pdf/081705/DirectAssessmentCompetencyBased.pdf>), Higher Learning Commission (<http://ncahlc.org/Monitoring/monitoring-and-reporting.html>), and Middle States Commission on Higher Education (<http://www.msche.org/?Nav1=POLICIES&Nav2=INDEX>).

⁴ For examples of institutions and the organizations supporting collaboration in CBE, see CBE Jumpstart (<http://www.cael.org/what-we-do/competency-based-education>), administered by the Council for Adult and Experiential Learning (CAEL), the EDUCAUSE Next Generation Learning Challenges Breakthrough Models Incubator (<http://www.educause.edu/events/breakthrough-models-incubator>), and the Competency-Based Education Network (<http://www.cbenetwork.org>).

former in its strictest form, as almost all higher education professionals would agree that a rote repetition of what was learned is not a sufficient demonstration of student achievement. So the philosophical debate is actually more subtle. It is about degrees of competency demonstration, and degrees of competency leading to actual mastery. And it is about how different assessors choose the types and degrees of competency to which credits are assigned. Thus, how credits correlate (or not) to competencies is really the nexus of the philosophical debate.

Digging a little deeper, the discussion becomes more subtle yet, as there are degree and licensure programs that have always had to measure and assess competency and mastery – such as in medicine, nursing, law, accounting, education, and a number of other disciplines. Is it the case that credits in these disciplines hold a greater value than in other disciplines, because the need for basic comparability across degree programs has always been greater for these disciplines?

Considering the transferability or portability of knowledge, credits, and competencies, one practical implication is the use of credits from one institution to another. Credits are rather easily transcribed and transferred, although students often do not get the full value of these credits at a different institution. How are competencies as units of knowledge and/or ability transferred? Are there new methodologies or technologies that can assist with this? If none exist as of yet, what are the specifications needed for such innovations? The basic university transcript does not seem like a solution, especially in the case of transfer of competencies between institutions that use different sets of competencies or different assessment methodologies for competencies.

Naturally, this leads to the notion of possibly sharing or standardizing competencies as open assets. Wouldn't competencies transfer more easily if they could be standardized across university programs? Does this imply that every university program should follow the model of licensure programs which require a comprehensive licensure examination or assessment, for example? Are standardized competencies a requirement to establish their value? And would standardization of competencies contribute to higher education ecosystems of trust and validation? (Soares, 2012)

Other key philosophical challenges pertain to faculty performance and responsibilities. Under a competency-based system, how are faculty performance and load defined? How are faculty trained and their performance measured? Should the measurements be based on the competency achievements and mastery of their students? Given the recent trends in disaggregation of faculty roles in CBE programs, what new models for faculty responsibilities are evolving, and how well do these models meet the needs of stakeholders in our educational ecosystems? Are these models more scalable than those used under standard credit-hour teaching systems? Are they less so?

- **Policy implications:** Because a competency-based system can make learning more visible, the portability or transferability issue, particularly around basic skills assumed

to be delivered through general education programs, could be greatly simplified. With minor differences between institutions in criteria for evaluating critical thinking, written communication, information literacy, quantitative reasoning, oral communication, scientific reasoning, etc., a competency-based medium for transfer could be much more straightforward than in current practices.

- **Practice implications:** Competency-based systems and the disaggregation of the roles of faculty offer renewal for faculty through a shift from being responsible for everything that occurs in a course to focusing on specific skills and passions: designing and curating powerful environments for students' construction of knowledge; mentoring; evaluating student performance; and evaluating program performance.

Competencies as currency

How can competencies provide a new, complementary currency for professional credentials, just as credit hours already have recognized currency value? In order for competencies to have currency value, they need to provide real benefits in complex ecosystems of stakeholders and processes.

Just a few representative examples illustrate how competencies provide practical value and address some critical needs of key stakeholders in post-secondary ecosystems.

- Government agencies benefit when competencies are well-aligned with workforce development, providing direct economic/employment benefits.
- Educational institution leaders benefit when competency-based programs improve student satisfaction, retention, and degree attainment.
- Institutional administrators benefit when competencies are mapped to clear, logical degree requirements and provide scaffolding for the relationships among stackable credentials.
- Subject matter experts benefit from competencies that clearly articulate the learning outcomes within and across disciplines.
- Teaching faculty benefit from transparent understanding of targeted student learning outcomes.
- Assessment stakeholders benefit from well-defined competencies that reflect learning achievements to be evaluated and measured, both for individual students and across programs and degrees.
- Students benefit from transparent understanding of the competencies required for credentials.
- Employers benefit from transparent understanding of the competency mastery of graduates.

The validation of competencies and evaluation of how well they meet the needs of 21st-century educational ecosystems can be honed by collectively answering questions such as:

- Do the competencies accurately represent the learning achievements they're designed to represent?

- To whom are the competencies meaningful, and how is that meaning applied in ways that provide value for stakeholders?
- Has the learning represented by the competencies been accurately assessed?
- Are the learning achievements represented by the competencies applicable in multiple contexts, and what is their “exchange value” in various contexts?

These are some of the same questions as can be applied to the value of credits, and the responses will not be the same for credits and competencies, as these representations of learning achievements serve different purposes. Competencies are more variable and more prone to change over time than the fixed-unit representation of credit hours, which is both a strength and a weakness. So it's not surprising that competencies also present challenges for key stakeholders in post-secondary ecosystems, as these examples illustrate.

- Government stakeholders: Competencies are not equal units of measurement, and students pursue different paths to competency mastery, complicating processes for determining financial aid and other types of student support.
- Educational institution leader stakeholders: Competencies change over time, requiring ongoing investment in redefinition of degree requirements and alignment to workforce needs.
- Institutional administrator stakeholders: Because competencies are not equal units of measurement and students pursue different paths to competency mastery, institutional reporting, financial, and time/term-based processes are more complex.
- Subject matter expert stakeholders: Changes in competencies over time require ongoing revision of learning resources, curriculum, and competency scaffolding.
- Teaching faculty stakeholders: Students' progress toward competency mastery and their need for support is variable, unlike the predictable pacing and load of terms with final grades delivered at an end-date.
- Assessment stakeholders: As competencies change over time, assessments and related resources also require ongoing revision, complicating assessment research and longitudinal analysis.
- Student stakeholders: Lifelong learning requires ongoing mastery of new/additional competencies, unlike the fixed credits represented in a terminal degree.
- Employer stakeholders: Alignment of competencies to job requirements needs periodic revision and investment in ongoing collaboration with education providers for workforce development.

The requirements for a terminal, credit hour-based degree can be relatively static for decades, providing stability and certainty for stakeholders in our educational ecosystems. But the cost of this stability can be stagnation and a lack of dynamic interactions between academic institutions and other stakeholders. A balance between the benefits of credits and competencies can provide a basis for ongoing revision, rejuvenation, and investments in innovation, making post-secondary credentials living, breathing reflections of the needs of a 21st-century world.

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PDPIE FRAMEWORK: ONLINE COURSE DEVELOPMENT QUALITY CYCLE

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Introduction

The growth of online education, new approaches for its delivery, its convergence with on-campus learning, and its global impacts have created considerable discussions in quality of online learning all around the world. This has also brought educators' attention into the practice of those professionals involved in online course development including instructional designers who are the key professionals involved in online course development. Planning, Design, Production, Implementation, Evaluation (PDPIE) Framework is an online course development quality framework which is the result/outcome of a PhD study conducted in Spain and Canada. The study and observation of the evolution of technology, instructors and learners' roles, and instructional designers' cultural and educational differences led to development of a flexible online course development guideline within this field. The guideline can be found at http://wiki.ubc.ca/Design_Quality_OnlineCourse (Sharif, 2014)

Context and methodology

The PhD study took a comprehensive look at the key elements for quality online courses within the field of instructional design by examining the core elements of effective design in existing guidelines and benchmarks while taking into consideration the impact of instructional designers' cultural and educational backgrounds. The research also explored key factors for a quality online course in different phases of the course development process. To gain a better understanding of the ways in which designers approach their work and strive for a good-quality result, different research methods were used in this study. A quantitative approach, which included surveys in different steps and locations, was used to gather the elements that 52 designers focus on and find critical in their quality design. The surveys were conducted in both Spain and Canada to examine the impact of culture on core elements of design. A qualitative approach, an interview, was the main focus of this study and was used to explore the views of a good-quality course, examining the backgrounds and experiences of eight instructional designers and their views of "an ideal course". Similar to other professionals in the fields, the instructional designers in this study agreed that having a guideline or a policy was important that is also supported by other professionals in the field (Barker, 2001; Beck, 1997; Herrington, Herrington, Oliver, Stoney, & Willis, 2001); however, they emphasized that the guidelines need to be flexible. They argued that the field of

instructional design as well as online learning environments are changing as technology is evolving; therefore, a flexible descriptive quality framework seemed to be what they needed for online course development, which led to the development of the PDPIE framework.

PDPIE Quality Framework

The framework consists of five sections; each section covers one of the five phases of the course development cycle: planning, design, production, implementation and evaluation. In the online resource in which the framework is presented in detail, each phase starts with an overview, a descriptive image, and a list of tasks suggested to be performed by an instructional designer within that phase. The resource is based on team approach course development; however, there are instructions for lone ranger approach as well (for those instructors who do not have any resources or support to develop their online course). The resource is flexible in the sense that it is accessible online and is licensed under creative commons. Those who decide to adapt it should be able to customize and update it regularly. The resource was developed in Wiki so that the content can easily be transferred to a website, a Learning Management System, or a course. It is also user friendly and easy to update.

Inspired by Analysis, Design, Develop, Implement, Evaluation (ADDIE) Model

PDPIE phases are close to the hybrid design model proposed by Passerini and Gragner (2000), which also has five phases – analysis, design, development, evaluation, and delivery. The phases in this framework consist of planning, development/design, production, implementation and evaluation. PDPIE share many qualities with ADDIE model. The first phase of the PDPIE calls for conducting a needs analysis, which covers learners' characteristics, context, and instructional goals. In the second phase, the main content and instructional strategies are determined and developed. In the production phase, the content is developed fully online. The implementation covers instructors' training, delivery, learners' support and resources. Finally, the last phase covers evaluation in both formative and summative formats. Figure 1 demonstrates PDPIE Quality Framework at a glance. All the phases are presented and discussed in following sections.



Figure 1. PDPIE Quality Framework

Planning phase

The first section of PDPIE framework covers the quality/essential tasks that need to be done in the course development planning phase. The major tasks in planning include assess needs, define project scope, determine resources, create a project schedule, and determine budget. This phase includes conducting a needs analysis, which covers analysis of learners' characteristics, context, as well as instructional problems and instructional goals. Many educators in the field support the importance of needs analysis for the design of syllabus and course design (Gomez Garcia, 2007; Pilar & Mayo, 2000; Hutchinson & Walters, 1987). During this phase (and in a team-based approach), the roles and responsibilities of the team members as well as involvement of a reviewer and students should be discussed and confirmed. The course author/instructor is also encouraged to work with a project manager/instructional designer to outline key objectives, teaching methodologies, planning details, schedules, and goals, much of which will be collected via the course planning document that is presented at <http://wiki.ubc.ca/Sandbox:Course Planning>.

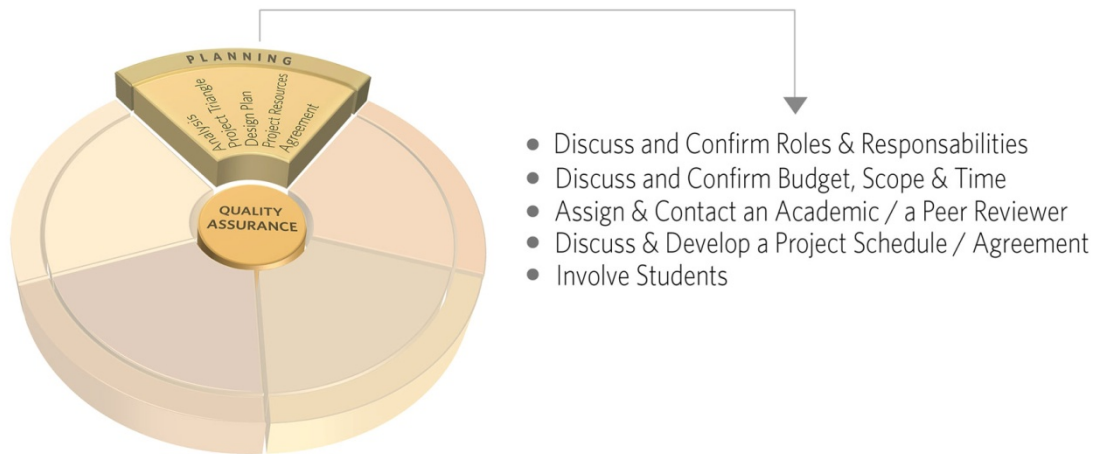


Figure 2. Planning Phase and Key Elements/Tasks for Quality

Design and development phase

The design and development phase (see Figure 3) is characterized by the author creating and writing the course content. At this stage, it is recommended that the course author look at one quality assurance guideline as a reference while developing the content. This might be a guideline that is developed in house or one is that is developed externally. A Guide to Quality in Online Learning, from Academic Partnership (2013), is a valuable resource that lists many of these guidelines. The objectives, scope, a sample lesson, and other sections from the course-planning document can also be helpful at this stage. It is important to discuss copyright and use of open resources. For content and additional learning materials, it is also very important to involve institutions' librarians. Discuss the outcomes and different assessment strategies that help learners to achieve those outcomes. In this stage, the course author needs to work closely with an instructional designer, reviewer or a colleague in the field to review, modify and improve the content.

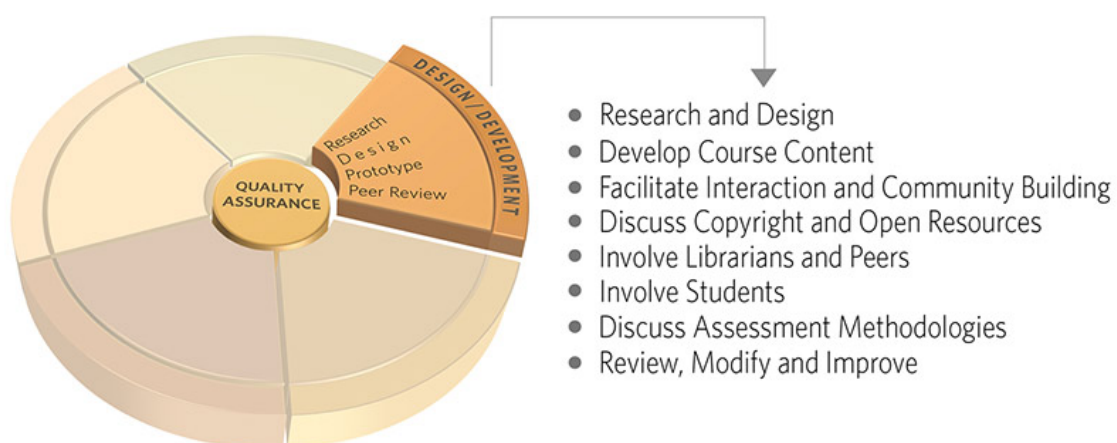


Figure 3. Design and Development Phase and Key Elements/Tasks for Quality

Production phase

In this phase course content is finalized and handed over to the production team to be developed fully online. The instructional designer needs to discuss and work with the team members to ensure W3C standards are followed for accessibility purposes. For example, the course programmer needs to add alternative text (ALT) for all the images that are provided by the course author. She/he needs to make the navigation consistent and use we-safe colours in the course. This ensures students with disability can access the course with ease. It is also important to ensure that tools and media used in the course support the course learning objectives. When developing course materials online, breaking them into small, and manageable modules, increases learners' awareness of the conceptual structure of each module and also allows for greater flexibility in pacing their learning (Johnson & Aragon, 2003). Figure 4 demonstrates the production phase and the key tasks that need to be complete at this phase for quality design.

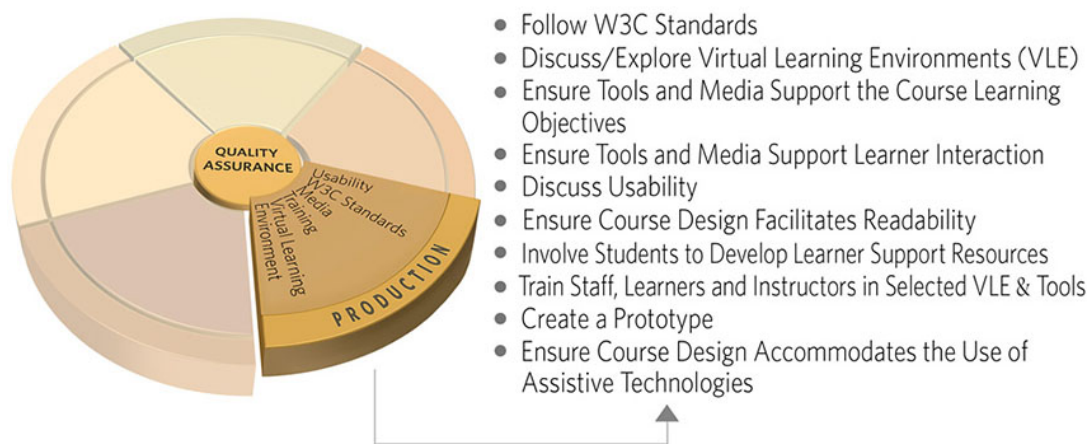


Figure 4. Production Phase and Key Elements/Tasks for Quality

Implementation phase

This phase comprises the course offering and teaching process (see Figure 5). At this stage, all the course components have been thoroughly reviewed online and the instructor should have been trained in the learning management system (i.e. Blackboard, Moodle) to feel comfortable in the learning environment. The instructor should strive to create a learning community by his/her presence, encourage critical thinking and promote active learning (Caplan, 2004). The instructional designer needs to ensure that a welcome email/letter is sent to students registered in the course prior to the course start date to begin building the learning community. The instructional designer needs to ensure faculty support is provided through mentorship, and technical support. It is also important to ensure learners have full access to technical, and academic support.

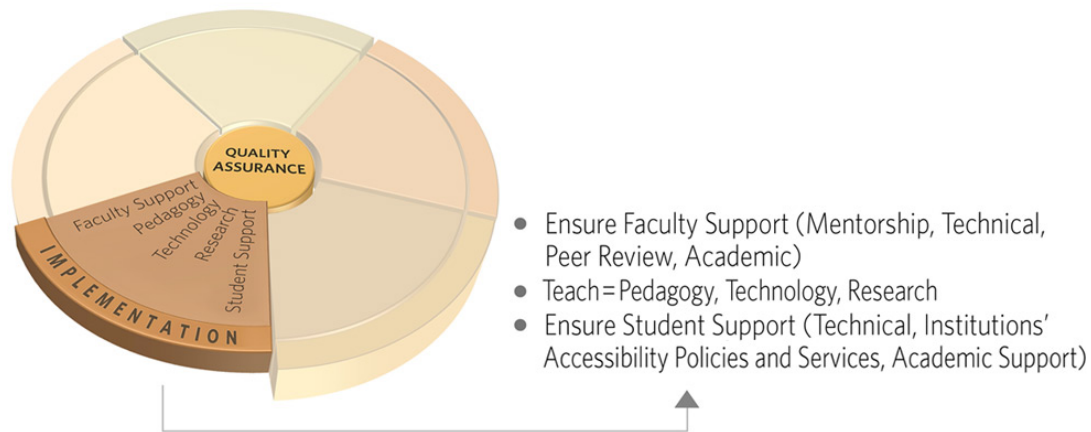


Figure 5. Implementation Phase and Key Elements/Tasks for Quality

Evaluation phase

The evaluation phase generally takes place once the first offering of the course has successfully come to an end. To prepare the course for its next offering, the course development team meet again to evaluate the course based on student evaluations, peer feedback, instructor's notes/reflection and the team feedback. Figure 6 demonstrates the evaluation phase and the key task that need to be completed during this phase.

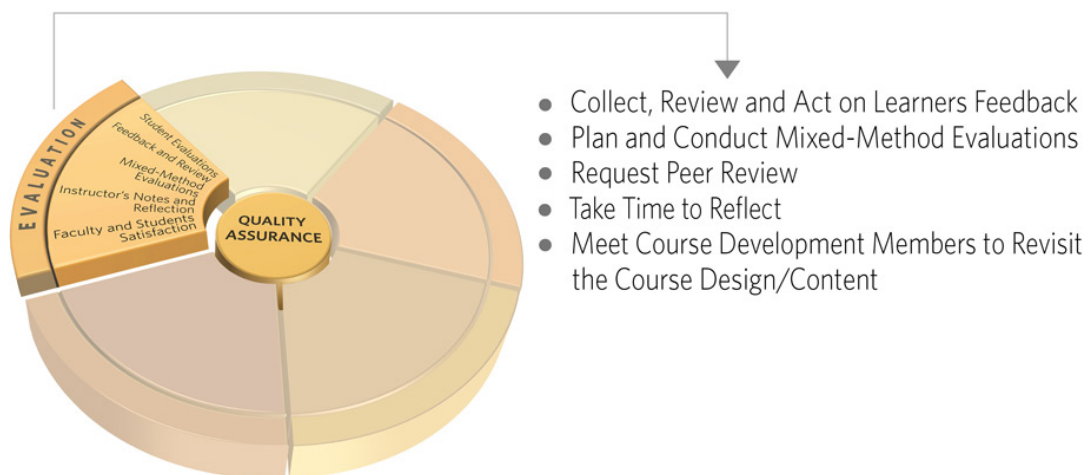


Figure 6. Evaluation Phase and Key Elements/Tasks for Quality

Conclusion

PDPIE Framework is a quality online course development framework. It is based on a team approach; however, the resource has been developed in a way that even instructors who do not have a team can also use it to improve quality in their work. In each phase, the roles and required tasks are discussed and different guidelines, and checklists are developed and shared. The terms and steps are explained in detail to avoid misinterpretations. Supporting documents developed for each phase include templates, samples and guided questions that help designers and instructors to do their jobs more efficiently with the timeline given. The resource has been accessed by 1364 individuals so far and has been used in different

universities in Spain, Canada and Australia. One goal for the development of this resource is to get instructional designers one step closer to a quality design; the second goal is to provide a resource that can be modified and improved as the field and technology changes.

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A QUALITY SCORECARD FOR THE ADMINISTRATION OF ONLINE LEARNING PROGRAMS IN HIGHER EDUCATION

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Introduction and background

The development of the Internet has forever changed higher education and distance learning programs throughout the world. Prior to its arrival, distance education, also called distance learning or distributed education, used varied methods for course delivery such as mail correspondence, telecourses, or satellite delivery, and was clearly on the periphery of higher education. When course delivery using the Internet became an option – creating the new phrase *online education* – it wasn't long before enrolments began to rapidly increase and online education became firmly entrenched within higher education, especially in the US. In fact, numerous studies cite tremendous growth in online education, which has outpaced that of traditional higher education with the majority of accredited institutions in the United States offering online courses (Allen & Seaman, 2008, 2010, 2011, 2013, 2014; Parsad & Lewis, 2008).

While some institutions willingly responded to the increased student demands for flexibility and convenience, others grudgingly acquiesced because of the increased competition for student enrolment. However, after experiencing success with a few online courses, many institutions developed full degree programs to be offered completely online. While the online programs were expected to increase student access and increase enrolment, both administrators and faculty expressed concern regarding quality (Benson, 2003; Shelton, 2010) such as how to measure it and what evaluation methods should be used for continuous improvement strategies and accreditation requirements.

Interestingly, many institutions advertise using the word “quality” with online education programs because they believe it creates public interest and market advantage. However, quality online education is still difficult to define (Meyer, 2002), which leads to a need for a more comprehensive system for evaluation (Lockhart & Lacy, 2002). Unlike industry recognized quality stamps for corporations, such as the Total Quality Management (TQM) criteria for excellence or the Malcolm Baldrige National Quality Award, an instrument did not exist in the US for online education for measuring quality programs, and facilitating strategic planning and program improvement. This paper focuses on the Quality Scorecard for the Administration of Online Programs (Appendix A). While it was originally developed as the instrument for quality evaluation of online programs in the US, the basic foundations of quality should apply beyond those programs in the US.

Literature review

Onay (2002) recognized that maintaining academic standards for online courses and programs is a concern for many institutions. Thompson and Irele (2007) surmised that while online education evaluation does occur, it is “often poorly designed and/or underfunded; it is more of an afterthought rather than an integral part of planning and implementation” (p.419). Moreover, Stella and Gnanam (2004) believed that quality indicators for traditional education may be clearly defined but applicable standards are needed for benchmarking quality assurance in distance education. They recommended that a group of experts in distance learning be involved in the evaluation process. Furthermore, Lesht, Montague, Page, Shaik and Smith (2006) recommended that “a common set of metrics on key issues and program indicators” (p.103) should be identified to allow for inter-program research comparisons and benchmarking. After a thorough review of the literature, it was clear that a standardized, industry recognized instrument that identifies quality in online education programs in higher education did not yet exist.

Quality scorecard research methodology

Because quality is difficult to define, the Delphi methodology (Dalkey & Helmer, 1963) was selected for the study, because “it replaces direct confrontation and debate [with] a carefully planned, anonymous, orderly program of sequential individual interrogations” (Brown, Cochran & Dalkey, 1969, p.1). The Quality Scorecard (QSC) was needed for the purpose of measuring and quantifying elements of quality within online education programs in higher education. Seventy-six experienced online education administrators were invited to participate and forty-three agreed to be part of the study. More than 83% of the panel members had nine or more years of experience, which further strengthened the validity of the study. The six-month long research process produced a fully developed instrument for online administrators to use for program evaluation and may be used at the program, college, or system level.

Results

The Quality Scorecard is organized by the nine categories determined by a panel of experts: Institutional Support; Technology Support, Course Development and Instructional Design; Course Structure; Teaching and Learning; Faculty Support; Student Support; and Evaluation and Assessment. A total of 75 quality indicators, each category is divided into a list of quality statement indicators that administrators can use to determine strengths and weaknesses of their program. The scorecard may be used to demonstrate to elements of quality within the program as well as an overall level of quality. In addition, weaknesses are identified that can be used to support program improvement and strategic planning initiatives.

Each of the 75 quality indicators is worth one, two, or three points and corresponds to a provided rubric. The administrator will determine at what level their program meets the intent of the quality indicator after examining all procedures and processes. The following guidelines are provided as part of the coversheet for the scorecard:

- 0 points = Deficient. The administrator does not observe any indications of the quality standard in place.
- 1 point = Developing. The administrator has found a slight existence of the quality standard but difficult to substantiate. Much improvement is still needed in this area.
- 2 points = Accomplished. The administrator has found there to be moderate use and can substantiate the use of the quality standard. Some improvement is still needed in this area.
- 3 points = Exemplary. The administrator has found that the quality standard is being fully implemented, can be fully substantiated, and there is little to no need for improvement in this area.

The following scoring guidelines are also provided as a general recommendation for the online education administrator:

- 202-225 points – Exemplary (little improvement is needed);
- 180-201 points – Acceptable (some improvement is recommended);
- 157-179 points – Marginal (significant improvement is needed in multiple areas);
- 134-156 points – Inadequate (many areas of improvement are needed throughout the program);
- 133 points and below – Unacceptable.

The Quality Scorecard was developed to be utilized by an administrator as the researcher believed that the only the administrator would have a large enough perspective and knowledge of all elements of the online program.

Discussion

The Quality Scorecard is organized into nine categories: Institutional Support; Technology Support, Course Development and Instructional Design; Course Structure; Teaching and Learning; Faculty Support; Student Support; and Evaluation and Assessment. The following discussion is presented within each of those categories.

Institutional support

The Institutional Support category addresses quality indicators that focus on the institutional role in online learning: policy, decision-making, resources, and strategic planning. For example, a process for student authentication must be in place for making sure that students are who they claim to be. In other words, we must verify student identities. An additional policy should clearly articulate who owns course materials that are developed for online courses. The panel of experts believed that an effective and comprehensive governance structure for decision making related to distance learning is needed.

For a quality online program, resources must be provided, both budgetary and human. This should be included in the strategic plan for the program as well as the institution. In addition, the panel recommended that institutions define the strategic value of distance learning and make sure all relevant groups within the institution have received clear communication regarding its value. This indicator may have been suggested because in some institutions, distance learning programs have been left on the periphery of the institution and not given respect or well-deserved resources.

Technology support

Within the Technology Support category, the expert panel recommended that technology must be considered mission critical by the institution. This category addresses the following areas: a technology plan exists that includes security measures such as password protection; the technology systems used for delivery are highly reliable and being measured for performance; and a centralized system to support the technology infrastructure needed for quality distance learning programs. The technology utilized for the online program should receive equivalent support and a backup system should be in place and maintained for data availability. In addition, on-going technological support should be provided for faculty, students, and staff. It is also recommended that the institution understand the importance of support and the reliability of data retrieval in case of technological failure.

Course development and instructional design

The Course Development and Instructional Design category contains the quality indicators focused on the development on online course materials. There should be basic minimum standards for course design used, which should be based upon student-centred instruction. There should be consistency in course development for retention and quality and the course materials are to be reviewed periodically to maintain relevance. The panel recommended that the course learning outcomes be measurable, the technologies selected should support the learning outcomes, and appropriate assessments measure the outcomes. In addition, the course design should support faculty and student engagement, technologies are evaluated for online learning; instructional design is provided, and faculty should be in control of the curriculum.

Course structure

The Course Structure category focuses on the individual course; for example, a comprehensive syllabus that includes objectives, outcomes, evaluation methods, textbook information and transparent course requirements must be provided to students. Online students should be provided access to library and learning resources and student expectations for assessment and faculty response time must be provided in the syllabus. The panel of experts added a four quality indicators that address the following areas: student technical support explained or linked in the course; course materials are accessible and usable; alternative instructional strategies are provided for disabled students; and student-to student collaboration is encouraged with opportunity and available tools. The potential needs for student accessibility,

which is increasingly becoming an important consideration for online education programs, are an important consideration in online course material development. With the tremendous growth of enrolment, the possibility of disabled students needing accessible online course materials increases tremendously.

Teaching and learning

The Teaching and Learning category recommends strategies for the actual teaching that occurs online. Quality indicators encourage student-to-student and faculty-to-student interaction. Instructor feedback provided on assignments in a timely manner is critical for student success. In addition, effective methods for research and evaluation of online resources should be taught. Moreover, students must have access to library professionals and online resources to assist with research and resources. Many online programs are providing virtual librarian access today by using instant messaging, chat, or virtual classroom programs.

Social and student engagement

The panel of experts created the Social and Student Engagement category with only one approved quality indicator. Students should be encouraged to form an online learning community and interact with other students. This particular indicator could be considered vague and difficult to identify; however, the intent of the panel was for the program to have made an effort toward providing opportunities for online student to experience community outside the classroom. This could be provided with the use of social networking websites such as Facebook and Twitter, blogs, wikis, and discussion forums.

Faculty support

The Faculty Support category recommends that faculty will various types of support for teaching online. For example, the provision of technical assistance, technology training, and training about Fair Use, plagiarism, and legal concepts should be provided. Additionally, the panel of experts determined that on-going professional development should be provided, standards should be determined for faculty engagement such as how quickly an instructor should respond to online questions, and workshops for emerging technologies should be offered. The on-going professional development indicator could be satisfied with workshops for emerging technologies being provided; however, the panel of experts believed it was important enough to be a separate indicator. The on-going professional development indicator could include activities such as helping faculty with time management and pedagogical strategies.

Student support

The Student Support category contains 16 student-centred quality indicators, the most in any of the categories. The expert panel recommended that students should be advised about the necessary motivation and commitment it takes to be a successful online student. Students should also be advised about minimal technology requirements and program and support service information should be clearly provided to students. Library use, access to student support services such as advising and tutoring and training should also be provided for students. The student support services provided should address feedback and problems and offer a complaint submission process. Additionally, the panel of experts determined the following indicators were relevant: academic, career, and personal counselling should be offered; minimum technology standards exist; and student support services must be provided such as financial aid, advising, and peer support. Furthermore, online disabled students will require additional support and all online students should have access to course materials including ISBN numbers before the course begins.

Evaluation and assessment

The final category, Evaluation and Assessment, focuses on the data that must be gathered to clearly demonstrate quality. A program evaluation with specific standards should regularly occur as well as a variety of data for evaluation and changes should be used. Eight quality indicators were added by the panel of experts that focused on the following areas: there is an alignment of learning outcomes throughout the curriculum; assessment of faculty and student support services is in place; assessment of retention at the course level occurs; assessment of retention and recruitment at the program level occurs; compliance to disabled student standards is demonstrated; course evaluations are examined in relation to faculty performance; faculty performance is regularly assessed; and course evaluations collect student feedback regarding the content and instruction. This category takes the most time because it requires a multitude of data sources be analysed and reviewed.

Conclusion

Quality is a perception that varies within industries, including that of higher education whose traditional indicators for quality are changing. In fact, Pond (2002) observed,

It is quite clear that education in the 21st century presents challenges to quality assurance that were unimaginable just a quarter century ago. E-learning in particular, with its ability to render time and place irrelevant, requires that we abandon traditional indicators of “quality” such as “contact hours,” “library holdings,” and “physical attendance” among others in favor of more meaningful measures. (para. 11)

As we abandon the traditional indicators we have used for so long, higher education needs a method to identify and assess quality within online education programs that could provide a way to benchmark and offer a path to improvement. This study provides an industry agreed upon process by creating a scorecard for the administration of quality online education

programs. Higher education needed a method to identify quality within online education programs that could provide a method for benchmarking and a path to improvement. The identification of quality online education programs satisfies a great need in the field and has been requested by many online education administrators as a tool for program improvement. This study provides just such a process, which is now being used throughout the United States, in Latin America after a norming process, and Mexico. The assessment of quality online education has never been more important as fierce competition from for-profit programs as well as many non-profits programs continues to increase and students all over the world are clicking to find a quality online degree program.

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Appendix A – The Quality Scorecard (page one only)

Quality Scorecard

for the Administration of Online Programs

0 = Deficient

1 = Developing

2 = Accomplished

3 = Exemplary

INSTITUTIONAL SUPPORT (27 POINTS)

SCORE

1	The institution has a governance structure to enable clear, effective, and comprehensive decision making related to online education.	
2	The institution has policy and guidelines that confirm a student who registers in an online course or program is the same student who participates in and completes the course or program and receives academic credit. This is done by verifying the identity of a student by using methods such as (a) a secure login and passcode, (b) proctored examinations, or (c) other technologies and practices that are effective in verifying student identity.	
3	The institution has a policy for intellectual property of course materials; it specifically addresses online course materials and is publicly visible online.	
4	The institution has defined the strategic value of online learning to its enterprise and stakeholders.	
5	The organizational structure of the online program supports the institution's mission, values, and strategic plan.	
6	The online program's strategic plan is reviewed for its continuing relevance, and periodically improved and updated.	
7	The institution has a process for planning and allocating resources for the online program, including financial resources, in accordance with strategic planning.	
8	The institution demonstrates sufficient resource allocation, including financial resources, in order to effectively support the mission of online education.	
9	The institution has a governance structure to enable systematic and continuous improvement related to the administration of online education.	

TECHNOLOGY SUPPORT (21 POINTS)

SCORE

1	A documented technology plan that includes electronic security measures (e.g., password protection, encryption, secure online or proctored exams, etc.) is in place and operational to ensure quality, in accordance with established standards and regulatory requirements.*	
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Note: The order of quality indicators within each category does not signify rank of importance. They are provided in random order.

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HOW ASSESSMENT TECHNOLOGY CAN DEVELOP TO ADDRESS THE CURRENT CHALLENGES OF ACADEMIC INTEGRITY

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Abstract

Academic integrity is essential to the reputations of our institutions as well as the credibility and perceived value of our degree programs. Of particular interest in recent years has been the increasing use of online assessments for both distance education and resident instruction students and the associated challenges and opportunities this relatively new methodology might present. How can software systems streamline the assessment process, ease the burden on faculty and students while maintaining the high standards of academic integrity we require? Further, how can new test development and delivery tools, coupled with online proctoring services, present secure exams that surpass the assessment and measurement abilities of traditional multiple choice and short answer type strategies?

In general, criterion-referenced tests and assessments measure student performance against predetermined criteria or learning standards (i.e. specific written descriptions of what students are expected to know at a specific stage of their education). Typically these are used to evaluate whether the student can perform at or above the established expectations. For example, by answering a certain percentage of questions correctly, they will pass the test, meet the expected standards, or be deemed “proficient”. Further, our norm-referenced tests are designed to rank test takers on a “bell curve”. Thus what we end up with is a small percentage of students who perform poorly, most trend towards average performance, and a small percentage perform above the average (one standard deviation). This result would imply that test questions are designed to accentuate performance differences among test takers, rather than identifying whether students have achieved specified learning standards, learned required material, or acquired specific skills.

So how can today’s technologies help shift the assessment strategies from ranking test takers against each other to more meaningful assessments of knowledge gained? How can our systems employed in online proctoring expand to include essays, open-ended questions, and case-based learning that work to uncover levels of deep learning?

This session will explore assessment strategies and try to answer some of the key questions:

- How can technology address “open-ended” questions or a combination of question, or item, types?
- How can learning gaps or academic deficiencies be captured and analysed?

How can technology assist with the evaluation of a course by using “pre-tests” and “post-tests” to measure learning progress?

USING MOOCS TO TRAIN THE NEXT GENERATION OF WEB ENTREPRENEURS: CHALLENGES AND OPPORTUNITIES

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Introduction

Over the last few years there has been a growing concern regarding the lack of qualified workers to fill out the increasing number of job vacancies, particularly in the ITC sector worldwide. Against the backdrop of rampant youth unemployment in Europe, the demand for ICT skilled employees is on the rise whilst the number of graduates with computer degrees continues to experience a falling trend. As a response to this situation and the negative impact that it can have on Europe's economic growth in a recovering economy, the European Commission has put forward several initiatives that can help reversing this tendency.

The present project, Fostering Web Talent in Europe by encouraging the use of MOOCs focused on web skills (<https://ec.europa.eu/digital-agenda/en/news/foster-web-talent-encouraging-use-massive-open-online-courses-focused-web-skills>), is part of Startup Europe (<http://ec.europa.eu/digital-agenda/en/about-startup-europe>), an umbrella initiative that aims at strengthening the business environment for web and ICT entrepreneurs so that their ideas and businesses can start and scale up in Europe. The project's main objective is to assess the possibilities that Massive Open Online Courses (MOOCs) (<https://ec.europa.eu/digital-agenda/news-redirect/14122>) focused on web skills offer to train aspiring web entrepreneurs. Throughout the project, several activities were conducted to explore and promote the use of MOOCs as one of the main ways of boosting web skills amongst web entrepreneurs in Europe.

Several activities were carried out over the course of the project that ran from January until November, 2014. The first activity consisted of a scoping study to chart the landscape in terms of demand and supply of MOOCs in the area of web development, which provided a precise mapping of the available MOOCs from European institutions. Germany, Spain, and Switzerland were the three main providers of MOOCs for web talent followed by France, the UK, Finland and the Netherlands. For comparison purposes, an initial count of the MOOCs for web skills available from US MOOC providers was made. It showed that as of March 2014, there was double the amount of MOOCs for web talent available in the US than in Europe.

In addition to the desk research, an online survey was carried out amongst students, entrepreneurs, leaders of innovation support programs, developers, and MOOC providers.

The survey aimed to identify the web skills which are most in demand and evaluate whether or not these are being covered by the current MOOC supply. The goal of this research component was to reveal insights that could help strengthen and enhance the use of MOOCs for web talent across Europe. The first two activities were published in this preliminary report (<http://openeducationeuropa.eu/sites/default/files/MOOCs-for-web-skills-survey-report.pdf>) where the main findings and recommendations were laid out.

The rest of the activities conducted throughout the project contributed to the creation and development of a network of universities and business schools in Europe interested in developing MOOCs for web talent. The first networking activity was a webinar (<http://openeducationeuropa.eu/en/blogs/summary-video-and-presentation-slides-mooc-accreditation-and-recognition-webinar>) conducted in July 1st, 2014 that revolved around the topic of certification and recognition of MOOCs to increase the employability of the European workforce. This was a topic that came up as a major concern amongst the survey respondents. The second networking activity took the shape of a workshop (<http://openeducationeuropa.eu/en/MOOCsworkshop>) that was run on September 17th, during EC-TEL 2014, and that included six paper presentations, a MOOC-platform panel discussion, and a response-speech to the papers presented.

The last activity of the project consisted of a one-day conference (<http://openeducationeuropa.eu/en/news/highlights-moocs-web-talent-final-conference>) that took place in Helsinki on November 17th featuring introductory presentations of the project, a keynote address by Matt Walton of FutureLearn (www.futurelearn.com), and a panel discussion that gave the other speakers a chance to recount their experiences with MOOCs.

Outcomes from the initial survey and desk study

The study is based on the analysis of over 200 MOOCs and almost 3000 online survey respondents from around the world. The objective of the study was to investigate the supply and demand of MOOCs related to web skills to better understand the potential of MOOCs to develop these skills and it is summarised in this preliminary report. The survey sample includes learners, MOOC providers, entrepreneurs, leaders of innovation support programmes, corporate managers, and IT professionals.

The desk research, conducted in March, 2014, provided a precise mapping of the available MOOCs existing in Europe in the area of web development and laying the groundwork to define the essence of the survey to be carried out. Through the desk research, we were able to identify 56 European and double the amount of US MOOCs (115) related to web skills. The initial offering of European MOOCs related to web talent across European countries was not evenly distributed: Germany, Spain, and Switzerland were the three main providers of this type of MOOCs with 18, 13 and 9 MOOCs respectively. The other major players in the field were France, the UK, Finland and the Netherlands with 6, 5, 4 and 1 MOOC related to web talent. The above-mentioned listing of MOOCs for web talent was provided by 23 European and 41 US higher education institutions.

According to a more recent count made in November, 2014, existing European MOOCs dealing with web talent have already surpassed one hundred MOOCs. The distribution of MOOCs per country follows the trend observed in the beginning of the project: the leading countries remain Germany, Spain and Switzerland with 34, 23 and 17 MOOCs respectively, whereas France, United Kingdom and Finland follow with 9, 8, and 7 MOOCs respectively. The Netherlands, Belgium, and Sweden are other early adopters who have jumped on the MOOC bandwagon with one MOOC each.

The results of the survey confirm that MOOCs are well-known and valued learning practices. The survey also revealed that there is a strong interest from employers and recruitment entities in exploring and acknowledging the training possibilities of MOOCs and other informal learning practices. Programming and web development skills were not the only skill sets in high demand. Entrepreneurs, leaders of innovation support programs and developers are also concerned about the lack of other skills such as graphic design, animation, eLearning, gamification, and digital art.

Overall, students showed an interest in obtaining more information on where to find MOOCs that are related to the aforementioned web skills. The current provision of MOOCs seems to be sufficient, but the students do not necessarily know where they can easily find the MOOCs they are looking for.

MOOC providers also value highly the benefits of MOOCs for their institutions and for their research, although they struggle with the amount of resources required to develop MOOCs within the current (higher education) educational system. The fact that cost, institutional culture and quality assurance are among the greatest barriers potential providers face in developing and delivering new MOOCs implies, that these concerns need to be addressed if we want to support the growth of European web entrepreneurship through this promising new educational instrument.

The concern of the students and interest of the recruiters about recognition of MOOCs as valuable (albeit informal) learning practices should not be taken lightly, and current policies should seek to implement measures that ensure such recognition in the near future.

Web talent MOOCs supply and demand

The different activities carried out during the project suggest that we have passed the “early adopters” phase according to the Technology Adoption Lifecycle Model, which describes the adoption or acceptance of a new product or innovation based on the demographic and psychological characteristics of defined adopter groups (Beal et al., 1957; also noticed by Daniel, 2014 and Stockport et al., 2012). MOOCs are a well-known phenomenon, both to people who are involved in them (providers and students) and also to people in other sectors, such as leaders of innovation support programs, corporate managers, and human resource personnel.

However, there is a need to facilitate better mapping of the supply and demand, and to ensure a better fit between them. For one thing, entrepreneurs and potential learners would like to see more hands-on, practice or project based offerings which develop specific skills. These should be suitable for on-the-job professional development.

By and large, there seems to be an abundance of provision of MOOCs, yet learners are struggling to find the MOOCs they need. Therefore, the provision of MOOCs does not seem to be sufficient by itself, and different measures should be implemented to make MOOCs accessible as proper training possibilities to a wider population beyond the one surveyed under this project.

Additionally, better search mechanisms are required, along with course metadata exchange standards to support them (An example for course data exchange standards can be found here: <http://www.xcri.co.uk>). Different network members have embraced MOOC models that have proven successful, such as University of Reading's MOOC Mobile Game Building MOOC which has now successfully run two iterations.

There are other approaches that address the aforementioned issues. The Webmaker Training uses different modules to teach mentors on how to teach the web or as they put it themselves, "creative ways to teach web literacy, digital skills and open practices". Another interesting example that can serve as an illustration of the synergy between MOOCs and other open educational formats is the Mechanical MOOC which operates without a professor and is built on existing open educational resources and open courseware. Similarly, Code Academy or the initiative code.org, although they cannot be categorised as MOOCs either, have been brought up often during the course of the project by stakeholders, as they offer key training opportunities for web and app developers.

MOOCs and the higher education institutional culture

Most current providers do not see MOOCs as profit bearing activities – the leading motivations for conducting MOOCs are public image, philanthropy, and experimenting with new pedagogies and technologies. Yet at the same time, they cite cost, quality assurance and institutional culture as the main barriers to provision, as also stated by Dillenbourg et al. (2014), Yuan and Powel (2013), de la Garza et al. (2015), and Daniel et al. (2015). While institutional culture is likely to change as MOOCs become the norm, so will their impact on the public image of the university that provides them.

If we want to sustain and make the MOOC phenomenon grow, we need to offer providers mechanisms that will help them reduce the cost and raise the quality of the MOOCs they produce. As an example, the MOOC design project uses a methodology that combines design narratives and design patterns to help MOOC providers share their knowledge of how to design effective MOOCs. The Integrated Learning Design Environment offers a range of open and free tools for designing MOOCs.

Regarding the issue of the institutional cultures, Professor Pierre Dillenbourg, one of the members of the advisory board of experts that reviewed the initial study for the present project, noted that universities might not be the best agents to produce MOOCs for basic web skills. These skills are orthogonal to the curriculum of computer science departments, which focuses on foundational and theoretical aspects of computing, such as algorithms and data structures, as well as advanced specialist topics such as cryptography and signal processing.

Professor Dillenbourg also suggested a “pyramid” of skills required to stimulate the European market: at the broad base level are elementary skills which could enhance any business, by opening up access to web and mobile channels. At the next level, there are web and mobile design and development skills required for web-centric companies, and at the narrow top end there are advanced skills such as security and data-mining required by specialist companies. The first two can be provided by MOOCs but the latter are only covered by formal academic education.

MOOCs certification and accreditation

Another critical issue that came up several times during the project is the availability of suitable certification schemes. The vocational focus of learners and entrepreneurs suggests that MOOCs are not, and should not, be modelled on the basis of academic programs. Most MOOC participants either already have a degree or are not seeking one. However, they wish to acquire skills that will help them to get a job, or to progress in their current job. Furthermore, they would like to have these skills accredited in a form that would be recognized by their current or future employers.

All the above relates to the design and quality control of MOOCs: providers need to point their MOOCs to vocational objectives, establish mechanisms to ensure their constructive alignment with these objectives, and collaborate with authorities to approve their certification (also addressed by Daniel et al., 2015, and Gaebel, 2014). An open badges system, such as Mozilla’s Open Badges, is another possible solution, much more aligned with the open education philosophy than recent developments in the MOOC ecosystem. Some of the most important MOOC providers, such as Udacity and Coursera offer certification possibilities that are available for a fee. Whereas the latter approach mirrors the traditional university system in its methods of assessment (by tests, exams, exercises), the open badges system offers students the possibility of displaying skills they acquired by showing evidence to back them up. For example, FutureLearn’s certification scheme implies, in its most complete form, a university-branded certificate that provides proof of learning on the course topic after taking a proctored exam. According to FutureLearn, these certificates are a “good way to show evidence of formal or informal Continuing Professional Development (CPD), commitment to a career path, or your understanding of a particular subject.”

The MOOC platform Iversity has been long pushing for their MOOC providers and other German universities to award ECTS credits. Iversity insists that beyond the certificate, the

importance of this step is that it serves as proof that a given MOOC is of sufficient quality and that by the end of the course students will have achieved the defined learning objectives.

As the MOOC phenomenon goes beyond the initial hype, one interesting element is emerging, namely MOOCs are being used by providers as a “techno-pedagogical laboratory”, and the lessons learnt inform their main practice in paid courses. This dynamic should be condoned, celebrated and encouraged. It suggests that the impact of MOOCs can potentially go far beyond their immediate domain, as a catalyst for change across educational systems.

The concern of the students and interest on the recruiter’s side about recognition of MOOCs as valuable, albeit informal, learning practices should not be taken lightly (Sangrà & Wheeler, 2013). Current policies should seek to implement measures that ensure such recognition in the near future.

Main findings

The main conclusions contained within this report reflect the findings of the initial desk research, the subsequent online survey, as well as insights from the different stakeholders who interacted one way or another with the project during the remaining project activities.

Web and mobile technologies are developing at an accelerating pace and to keep up with these changes, workers and potential workers in the start-up ecosystem need to constantly update their skills. Overall, MOOCs offer several opportunities that will be outlined next, but they also pose some challenges that need to be examined and addressed properly.

MOOCs have proven to be an important means to address the shortage in web talent as part of an ecosystem which includes free and paid courses, self-paced learning resources, learning communities, and traditional educational providers. However, in order to create sustainable and effective MOOCs for web talent, which address the real needs of web and mobile entrepreneurs, it is imperative that industry, educational providers and MOOC platforms collaborate in dynamic and agile partnerships.

Web entrepreneurs and their current and potential employees need hands-on learning experiences, grounded in real-life problems. In order to provide such experiences, providers need to work closely with eLearning pedagogy experts and industry partners. At the same time, employers need mechanisms for validating the quality and efficacy of MOOCs, and verifying the knowledge of participants either through formal credit systems, portfolios, or community credits.

Further actions

It is imperative that industry, educational providers and MOOC platforms collaborate in dynamic and agile partnerships to raise awareness, produce, and enforce the use of MOOCs for web talent in the framework of a MOOCs network which will provide concrete ways to aid building these collaborative partnerships.

Both companies and academic institutions should commit to work together to create possible schemes to offer credentials using a double-standard format where each would certify the knowledge and skills attained in a given MOOC: the theoretical one by a formal assessment and the practical one by virtual micro-internships. These certificates should be easily shareable on existing e-portfolios or online career-networks, and recruiters should acknowledge their value by giving extra value to candidates who possess them.

MOOC providers should mirror open access communities and should focus on providing the hands-on learning experiences required for teaching web skills that guarantee collaboration between peers, team work, interaction and feedback. Similarly, MOOC providers should tune their offerings to the needs of industry and the preferences of learners and should supplement existing study programs by offering MOOCs on niche or emerging topics which cannot be covered by formal academic programs.

Conclusions

MOOCs have the potential to be one of the educational practices, alongside other educational content delivery systems, that will help redress the skills shortage in an ITC-savvy workforce provided that employers, policy makers and providers work together to make them a viable, valorised, certified training option. MOOCs can be used as initial training for university introductory courses (to provide some hands-on practical knowledge), entry-level jobs, or for up-skilling workers in on-the-job training, but for that to happen they need to be able to satisfy the needs of the students for practical, hands-on, specific learning experiences.

Universities and other MOOC-providers should focus on creating MOOCs on niche or emerging topics which are hardly covered by formal academic programs. They should explore the possibility of establishing partnerships between different institutions to produce MOOCs in collaboration and sponsored by industry or government bodies.

For MOOCs to have a real impact on the learning side, they need to evolve pedagogically and move on from the current content delivery format to allow for a more practical, interactive, collaborative and hands-on type of learning required for teaching web skills. The quality of the learning experience, in terms of clarity, usability, and appropriateness of content and activities should be also taken into account.

The ultimate decision should be whether the purpose of using MOOCs to enhance web skills of young adults in Europe is about preparing a “silicon generation” so that these youngsters can work in web companies across Europe, or whether a more ambitious goal should be achieved, that is, improving the efficiency of IT practices in any company or business so that web components are widespread in all businesses in Europe. In other words, one should have a clear idea about who needs specific training and for what purpose before deciding what the best training option could be. However, and as the outcomes of this project reveals, MOOCs offer a potential solution in both cases. The question of whether MOOCs should mimic university courses or rather offer some practical training directed towards fulfilling specific

needs remains to be addressed, as well as which institutions are best placed to design, develop and deliver them.

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COMPETENCES AND SKILLS FOR 21ST CENTURY DIGITAL MEDIA PROFESSIONALS

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Summary

In today's businesses and organisations, the work of the digital media professional has become indispensable: our life revolves around expressions of media and arts, today created largely in digital form, designed by digital experts, executed by digital artists or workers, and distributed by digital campaigners and publishers. This highly diverse group of professionals consists of designers, creators, writers that are working across all media: radio, TV, press, web, multimedia, film, theatre, print, games etc. and not only in the artistic realm but in all segments of the society: information, news and press, advertisement and public relations, industry, commerce and education. Just imagine for example the world of education today without the input from the digital artist, the IT person or the media professional: the designers and creators of traditional learning and teaching materials as well as the network engineers, the information architects, the web designers, the usability experts, the photographers and video makers. A world of experts in its own right, a group of professionals of whom little is known.

The 2014 iProfessional survey with over 1100 participants from eight EU countries collected data about the skills and competences of professionals working in digital media and arts. The rich and complex data that are the result of the survey are sufficient to come to meaningful conclusions, especially with regard to the impact of education and training on this worker in his professional environment. The survey has allowed us to make a quantitative and limited qualitative analysis of the profiles of media workers with regard to the competences, skills and attitudes they possess, such as artistic skills, technical skills, business processes knowledge, communication skills, project management, structuring of content, teamwork, problem solving, time management, etc.

The survey resulted in a comprehensive list of transversal skills and competences that are required by the professional digital media and arts worker set off against those acquired in formal education as well as on the job. It is in this context remarkable to note that even though a wide range of high quality study programs exists in this area, there is hardly any tendency noticeable for certification-based protection of many of the jobs in this professional sphere: game designers, camera operators, photographers, web designers, graphics artists, audio engineers, etc. Meanwhile, employers of the digital media and arts professionals indicate that it is very difficult to recruit professionals straight from education as there seems

to be a gap between what is taught in school and what is required on the job, and this gap is not only a time lapse (businesses are often working with tools and technologies that are more advanced than those taught in schools) but also a competence and skills gap.

Introduction

The aim of 2014 iProfessional survey was to detect possible skills and competence gaps in the domain of digital arts and media professionals: the workers that are playing increasingly important roles in our information and communication driven society. To achieve this aim the European Commission supported the iPro project team to set up a pilot collaboration between HEIs and partners in 8 European countries to investigate the potential for closer collaboration between the world of professional digital media and arts and the higher and further education institutions for digital media and arts. This project tries ultimately to put in place a pilot mechanism to address mismatches it detects between expectations from the professional sector and the offerings from the HE sector, by designing and piloting a curriculum design framework for use in this specific sector. Partners in the project are on the one hand HEIs in Media and Arts Education, who have a stake in the demand and expectations from the industry they send their alumni to, and NGOs and SMEs that are involved in the design of learning and capacity building programmes in this same area. For more information on the iPro project, see <http://ipro-project.eu>.

The iPro project used a skill and competences needs analysis covering all relevant stakeholder groups, carried out by means of a large-scale survey. The target of the large-scale survey was companies, large and small, and any other organisation that employs (digital) media and arts professionals. The survey was designed based on existing surveys and on input from all partners as well as other reference sources in this domain. This work was based partially on research from UK iProfessionals, carried out in 2003 by Elaine England (ASTF), on the eSkills study UK, and their continuation by the Interfaculty in Maastricht with over 200 students from FAcH, HSZuyd and KHLim and more than 100 businesses in Belgium, Germany and the Netherlands in 2005, 2007 and 2009. This survey and project are in line with the European e-Competence Framework (ECF) (CEN, 2014) and potentially complementing this framework, as the iPro survey focuses much more on the creative and entrepreneurial sectors, while ECF covers ICT Professionals in all industrial sectors. These sectors are only partially overlapping.

The survey consisted of questions addressing the following main categories:

1. Personal details;
2. Company/employment details;
3. Formal education details (pre professional career);
4. On the job training details (during professional career);
5. Present competency and skill gap self-assessment;
6. Lifelong learning aspects;
7. Job appreciation.

These categories were elaborated in order to come to a list of questions that allowed us to create a survey instrument to make a quantitative and limited qualitative analysis of the profiles of media workers related to the competences, skills and attitudes they are required to possess for different media businesses. These skills included for example: artistic skills, technical skills, knowledge about client's business processes, skill in communicating with clients, project management skills, the ability to structure content, the ability to work and communicate in teams, problem solving capacity, team working/team skills and time management. The survey results in a comprehensive list of skills and competences required by the iProfessional set off against those acquired (in formal education as well as on-the-job). This gives the education community (higher education as well as VET and CPD) the possibility of relating the results to their own learning, training and capacity building trajectory or curriculum.

Survey results

The survey was held from 28 February until 24 April 2014. During that period, 1139 participants from eight countries completed the comprehensive survey with over 600 data points, which took the participant on average 21 minutes and 6 seconds to complete. The distribution of completion by country is as follows:

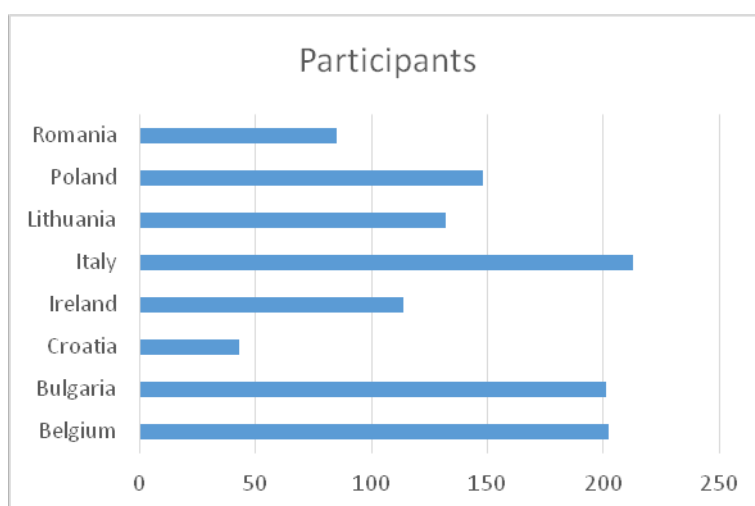


Figure 1. Distribution of participation of iPro survey

This is the first survey within this professional domain that surveys on this scale the professional skills and competences status of its target sector. If we assume that the sample was sufficiently randomly selected in all countries, and we use a margin of error (or confidence interval) of $1/\sqrt{N}$, where N is the sample size then we reach a margin of error of less than 3% overall, which is good. At the end of April 2014, the survey was closed and the results of the survey were collected, data was checked for integrity, and the free text answers in the survey (which was a significant part of the survey) were translated after which the data processing started. The resulting analysis is although comprehensive, significant, and representative for the sector, not the ultimate analysis that can be gathered from the rich and complex data that was obtained and therefore we continue to further analyse this data in

search of more relevant correlations that will support the design of education and training for digital media and arts professionals in Europe.

Professional profile

The largest proportion of survey participants comes from small and medium sized companies and organisations (Power, 2011), with an important proportion of these being micro-organisations, which is considered typical for this professional area (Montgomery, 2008). Many companies are young start-ups or work with large numbers of free-lance collaborators (Perrons, 2003).

Our survey also tried to profile the surveyed participants in terms of professional experience. For reasons of confidentiality, it was decided by the consortium that we would not ask the age of those surveyed; we considered it more relevant to determine their professional maturity by asking for their time in the profession (number of years of experience on the job).

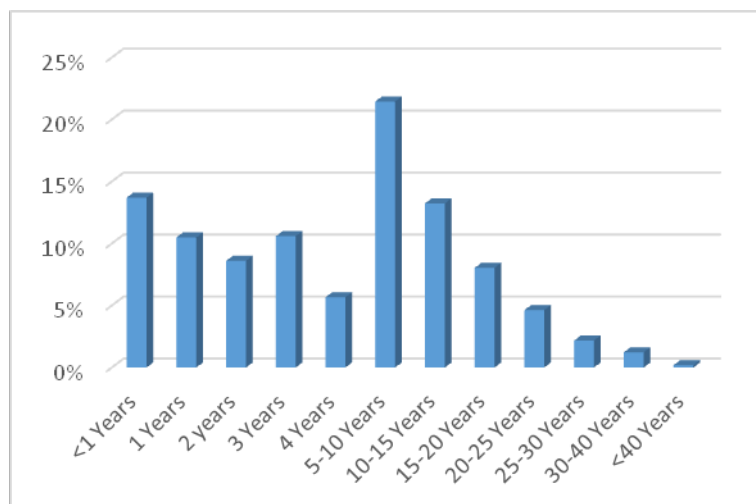


Figure 2. Years of professional experience: How long are you working in the digital media and digital arts sector?

The result is somewhat slanted to the left (towards a shorter work experience) which can be explained by a somewhat disproportionate number of students working in the sector (in some of the partner countries) but the impact of this effect is difficult to assess, also because in this professional domain there are a lot of young people streaming in to the profession. About 3 out of 4 surveyed professionals are less than 10 years actively working in this area.

The next question that gave us an idea as to the profile of the digital media and arts professional was a question related to his/her career profile (in relation to the present job situation). The question that was asked was whether this job was the survey participant's first job, and if it was not, whether they started their professional career in the digital media and arts sector or not.

It is worth noting that on average, one out of three professionals is entering the digital arts and media profession from a career path that lies outside this professional domain. It is almost more important to note that the distribution between “Not my first job, but I always worked in this (Digital media and digital arts) sector” and “Not my first job, started work in another professional sector” is almost equal. This points towards the observation that there seem to be many professionals that are coming from a professional background that is different from the media and arts sector.

Education profile

When observing the education and training path in the sector we see again that in general only one out of three professionals seems to have acquired his or her professional qualification by formal (higher) education. A similar proportion of those surveyed indicated that they had acquired their competences and skills in an informal (not-organised) manner (by self-learning or experience). When looking at the secondary level education profiles of those surveyed, we see that in general (except for Italy), there is only a limited exposure to digital media and arts skills and competences in secondary education for the professionals, who were participants in this survey.

Workplace learning

The survey also asked about practice and work based learning experiences. In a first question, we asked whether participants had experience with internships. Overall, less than half of all professionals (except for the Belgian participants) have done an internship. This is surprisingly low, certainly in a professional sector that is practice oriented. In a follow up question, we asked how long the internship had been. Except for Italy and Ireland, there is a small tendency toward short (max 4 months) of internships. Polish and Lithuanian participants and to a smaller extent Romanians too seem to have some opportunities and interest for longer internships of longer than 1 year.

On the job training

Formal on the job training

In this part of the survey, we asked our participants to comment on their competence, skills and knowledge acquisition while on the job. This is highly relevant for a number of reasons: first, there are many different tasks, task descriptions and job requirements in this sector where the technological environment is highly dynamic. Furthermore, as we have seen earlier, an important part of our target group comes into the profession without an education that is directly related to the job specifications (even if that were possible), or are coming from a sector which is not related at all to the digital media and arts business.

It would be expected that formal on the job training and capacity building in that case bridges the capacity gap for the media and arts worker in his/her (new) job environment. It would also be expected that the employer would be offering such opportunities to these workers. In the following part of the survey we try to detect how far digital media and arts workers are being offered or required to follow training on the job, both formally (organised by the

employer and following a programmatic approach) or informally (voluntary, on the worker's own initiative and without aspects of assessment, certification, programme of study etc.)

In general, with an exception for Lithuania, 2 out of 5 workers in the digital media and arts profession received a formal on the job training. This compares quite well to the number of workers that are joining the profession coming from another professional area or to the number of digital media and arts workers that are coming to this area from Higher Education studies that are not related in any way to the digital media and arts sector. This is a striking result but it is not yet clear whether this correlates significantly to call this effect systematic.

Skills and competence gaps

In the last part, which is probably the most important part of the whole survey, we try to understand what the professionals in the digital media and arts sector consider their most important skills and competence gaps, based on their working experience.

This part of the survey deliberately does not survey gaps in very specific technical competences, as they are as diversified as there are job descriptions and responsibilities. The following survey results will therefore not mention skills and competences such as PHP programming, drone design and operation, colorimetry, principles of portrait photography, e-commerce development, etc. where they are essentially the key skill or competence of the worker. The survey participants were asked to indicate in how far they felt they possessed a skills or competence gap for each of the above and also how large the gap was in their view: from no gap at all to large gap.

Need for specialised training and capacity building

When we compare the findings of the questions in this last part, we get a view as to where the deficits are in training and capacity building for the digital media and arts professionals in the eight countries of this consortium.

The results are pictured in the following table, in order of priority.



Figure 3. Skills gap minus skills obtained while on the job; competences and skills deficit

The greatest need for training is clearly for regulatory and legal issues, followed by a number of general competences for self-deployment such as knowledge building, global awareness and self-assessment. A number of very concrete practical competences and skills such as accountancy, business administration, programming and languages follow next.

This list gives an indication as to what professionals in the digital media and arts sector see as their biggest shortfall with regard to transversal competences and skills. It is important to note again that it was not the intention to survey the very specific technical skills or competences that are typical for each individual job description or responsibility.

Conclusions

This is the first survey of this size and with this detail in Europe within this professional category. It succeeded in collecting a good data set about the skills and competences of professionals working in digital media and arts in eight European countries. The rich and complex data that are the result of the survey are sufficient to come to a first set of meaningful conclusions, especially with regard to the impact of education on the worker in his professional environment including the effect of internship.

A number of conclusions can be drawn from this first analysis. The survey has allowed us to make a quantitative and limited qualitative analysis of the profiles of media workers with regard to the competences, skills and attitudes they possess related to media businesses, such as artistic skills, general technical skills, business processes knowledge, communication,

project management, structuring of content, team work, problem solving, time management, etc. The survey resulted in a comprehensive list of transversal skills and competences that are required by the professional digital media and arts worker set off against those acquired in formal education as well as on the job.

- The very high degree of variance of results demonstrates one of the assumptions that was at the origin of the survey: the fact that a significant number of employees are streaming in to the job without sufficient qualification in the specific professional field and/or with no relevant education or professional experience.
- A higher educational degree seems to have a positive influence on the “skills and competences gap”: a higher education results in a smaller gap.
- Male respondents show a lower average gap than female respondents.
- Company size does not show any correlation with the average skill gap.
- The average skill gap is lower with those respondents that are not in their first job, and even lower again where their previous job was also in the digital arts and media domain.
- Internships have a very positive effect on the skills gap if they last at least one year. This effect is amplified when the internship is supervised.
- There is also a relationship between the skill gap and the secondary school degree: those secondary education degrees that contain certain digital arts and media competences and skills have a positive effect on the skills gap later on in the professional career.
- To reduce successfully the skills gap the educational system should already focus on secondary level and on early specialisation in digital media in higher education. General higher degrees do not reduce the skills gap in the section of digital arts and media.
- Besides the very specific, directly job-related and highly specialised subjects, the professional worker in this domain is expected to build his/her competences in the following areas:
 - legal issues, regulation and IPR; accountancy;
 - business competences (writing for business, marketing, understanding business processes, etc.);
 - programming;
 - managerial competences (change and people management, HRM, international collaboration and project management, etc.).

Next steps

The iPro project consortium organises information sharing activities with the HE and the CPD community in this professional area and aims at co-designing with this community a curriculum framework that should enable HEIs and professional training agencies to closely monitor the gap that exist in their own education programmes, and to facilitate the creation

and exchange of study programmes, courses or modules that can complement the existing curricula, where such is relevant.

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THE 'BOOMERANG EFFECT': HOW OUTSOURCING IMPACTS ON THE WORKLOAD OF ACADEMICS

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Introduction

This paper is part of a bigger research project undertaken at UNISA (University of South Africa) to understand the changing roles and workload faced by UNISA academic staff in the present period of transition where UNISA changes from a correspondence institution to an institution which makes full use of the affordances of digital technologies. Two major reasons are cited as motivating the change: Firstly, the labour market expects university students to be digitally literate; secondly, UNISA hopes to improve the support for its students to increase retention and throughput rates (as requested by the Department of Higher Education & Training, DHET).

Research question & method

The research question guiding this paper was triggered by an internal time capturing report (du Plessis & Bester, 2014) at UNISA which observed a major perceived shift away from core academic tasks to tasks related to academic administration. How to explain this?

The *boomerang hypothesis* suggests one possible explanation. It is guided by the conceptual framework of the economics of distance education which suggests that traditionally distance education institutions can accommodate large numbers of students due to its cost-structure based on scale economies. This means that such institutions typically try to keep all those costs low which contribute to *variable costs per student*. Traditionally that meant shifting the onus of teaching away from interaction between teacher and student to a specially designed student-content interaction.

However, in a context where distance-teaching institutions want at the same time to make better use of the interactive affordances of digital technologies, including student-teacher interaction, the costs per student tend to rise. In such situations, efficiency considerations suggest limiting the 'damage' by resorting to outsourcing, especially those tasks related to increased student-teacher interaction, and to employ more staff on external, part-time contracts. This is the first leg of the boomerang hypothesis.

The second is that, while outsourcing indeed allows accommodating large number of students without increasing the fixed cost component of the instructional/research professional staff, the increased number of external part-time staff needs to be managed, which includes

recruitment, contracts, initiation and training in tasks, supervision and quality assurance, all adding to the academic administration workload of the core academic staff.

The research questions of this paper, derived from the boomerang hypothesis are:

1. Does UNISA react to mounting enrolment pressures by resorting to increased outsourcing?
2. Can the increases in outsourcing plausibly be connected to increases in academic administration thus explaining the perceived shift in academic workload documented in the UNISA time capturing results?

The research method, used to answer these questions, consists of an analysis of UNISA data from the HEDA (Higher Education Data Analyzer) database. We looked for data which would connect increased enrolment with increased levels of outsourcing. The extent to which the increased levels of outsourcing lead to increased academic administration is illustrated by modelling the effects of increases of enrolment in the case of marking student assignments.

The context: UNISA in transition

UNISA is an open distance learning university committed to “advancing social justice with an emphasis on redress, equity and empowerment of the previously disadvantaged groups in South Africa such as blacks, women, people with disabilities, the rural and urban poor and adults who have missed out on opportunities to access higher education.” (UNISA, 2008). This commitment to open access leads to large increases in enrolments.

At the same time UNISA is increasingly expected to turn *access into success*. Success includes two things: First students are able to complete their degree successfully in a reasonable time. Second, students need to get a university education which responds to some basis requirements of the labour market, such as digital literacy. Both success conditions are intertwined: Moving online supposedly both enables UNISA to support students and, by studying online, students will acquire the digital literacy required for success in the labour market.

But what could moving online mean for a mega-university with close to 400,000 enrolments and where many of its big courses exceed 10,000? Making better use of the interactive affordances of digital technologies comes at a cost. Student-teacher interaction means chunking up the courses of 5000 and 10,000 students into classes of 50, i.e. hundred classes or 200 classes¹. Even if a teaching assistant or e-tutor is supposed to cater for four classes you need to recruit 25 or 50 TAs respectively. These people need to be integrated in a deepening division of labour. They need to be inducted not only to competently navigate the LMS, myUNISA, but also how to moderate online discussions and mark assignments online; all this impacts on academics, on their roles and tasks, their work load, on costing, and on resource allocation.

¹ This is the approach taken by UNISA's signature courses (cf. Hülsmann & Shabalala, forthcoming).

The cost structure of Distance Education

Distance education always used two strategies to achieve efficiencies: *capital for labour substitution and labour for labour substitution* (meaning the substitution of expensive labour by less expensive labour).

Shifting the main locus of teaching away from interaction to course development is a case of capital for labour substitution. The fixed costs of course development can be spread over many students. Labour for labour substitution applies when the function of the teacher can be unbundled in different roles, some of which can be given to less qualified and less expensive personnel².

To simplify matters let us say that in a traditional distance education you largely substitute the teacher by the teaching material, in economic terms, a fixed cost. This is a capital for labour substitution. The teaching material needs to be replicated and shipped to the student but all of this contributes only marginally to the variable cost per student. The student-teacher interaction is kept minimal: there are a few assignments to be marked and some occasional evening classes. Grading is done according to rubrics and does not require subject matter experts with senior postgraduate degrees. This illustrates the role of labour for labour substitution. The combined arrangement allows keeping variable costs per students low; where fixed costs of course development are high (as it may be occasionally the case when TV production is involved), the they can be spread over many students. The low variable costs per student means that even an increase in student numbers leads to decreasing average cost per student³. One of the consequences of this may, however, be in terms of quality assurance.

The advantageous cost structure of distance education was historically necessitated by the lack of a technology sustaining responsive student-teacher interaction at a distance. While this leads to a form of distance education susceptible to scale economies it also was considered as a central weakness of distance education and the major reason why distance education was widely seen as second rate.

The new affordances of digital technologies (with learning management systems and videoconferences or social media) have changed all this: responsive student-teacher interaction is possible but it comes at the cost of eroding scale economies.

Scale-economies dependent institutions like UNISA which want to make better use of the interactive affordances of the digital technologies need to find a way how to wriggle out of the

² Both strategies aim at reducing the variable cost per student (V) in the total cost formula. The total cost formula reads: Total costs = Fixed costs + Variable costs or: $TC(N) = F + V \cdot N$, (F = Fixed costs, V = Variable costs per student and N = Number of students. (Note that Variable costs = $V \cdot N$.) Average costs are $AC = TC/N = F/N + V$. Increasing N means that AC falls asymptotically towards V. Capital for labour substitution shifts costs to F basically by reducing the need for student-teacher interaction; labour for labour substitution decreases the impact of student-teacher interaction by decreasing V, e.g. through casualization of labour.

³ Daniel et al. (2009) claims that distance education allows bringing down costs while at the same time increasing access and keeping up quality (Daniel's Iron Triangle). Daniel refers, however, to average cost per student.

incompatibility between scale economies and responsive interaction. To limit the 'damage', which increasing student-teacher interaction does to the cost structure of distance education, distance teaching institutions tend to focus on labour for labour substitution rather than capital for labour substitution. Outsourcing is a point in case.

However, before addressing the question to which extent UNISA, as a response to increased enrolment figures, resorts to increased outsourcing, the time capturing results, which gave rise to the boomerang hypothesis at the first place, should be summarized.

The time capturing results

The data made available by du Plessis and Bester (2014) suggest that, for the academic staff at UNISA, in the time period between 2009 and 2013 there had been a shift away from core academic tasks to academic administration. The data are based on an ABC (Activity Based Costing) exercise. Academic staff members are requested to complete a survey in which they distribute their work time as percentages. These time sheets are completed for each semester (of approximately 900 hours), but it is important to note that it is based on the *perception* of the academics' sense of percentage time spent. The time of the respective staff is then turned into hours and converted into costs (ZAR). These figures are represented in the Table 1⁴.

Much has been said about the credibility of these results. They are criticized for two reasons: Firstly, staff members report doing it rather carelessly and because they have to, not because they are convinced of the importance of the exercise. The time allocation breakdown is not based on diligent daily recording of activities but by rough estimates done in retrospect. However, the authors of the report argue that because of the sheer amount of academics having responded (about 83%) the perceived shift in workload should be taken seriously. Secondly, that the time capturing done in percentages, rather than in substantive hours, systematically excludes overtime. The allocation of workload is in percentage and, as soon as one allocates more than 100% the system stalls.

Table 3: Academic time capturing results from 2009-2013

	2009	2010	2011	2012	2013
Core academic	431,255	461,320	459,638	533,039	665,593
1. Course and curriculum development	22,836	24,963	26,749	30,436	39,299
2. Community engagement	34,536	37,759	36,399	40,401	58,844
3. Research	137,764	147,196	134,897	168,979	213,293
4. Tuition	236,119	251,402	261,593	293,223	354,157
Academic support	207,937	257,683	229,492	267,372	460,377
5. Academic administration	169,275	209,668	179,078	208,613	380,342
6. Academic personnel development	20,310	24,124	25,106	28,210	35,363
7. Community outreach	8,264	13,097	14,952	14,215	22,265
8. Executive management participation	10,088	10,794	10,356	16,334	22,407
Grand total	639,192	719,003	689,130	800,411	1,125,970

Source: Du Plessis & Bester (2014)

⁴ That the figures go up though they are based on percentages is due to the fact that, together with the increased enrolments, staff numbers and salaries increase.

If the core academic activities are disaggregated, it is not surprising that Research and Tuition are the biggest fields of activities. Course Development is the smallest field even as compared to community engagement⁵. Figures 1 illustrates the relative contributions of these core academic activities.

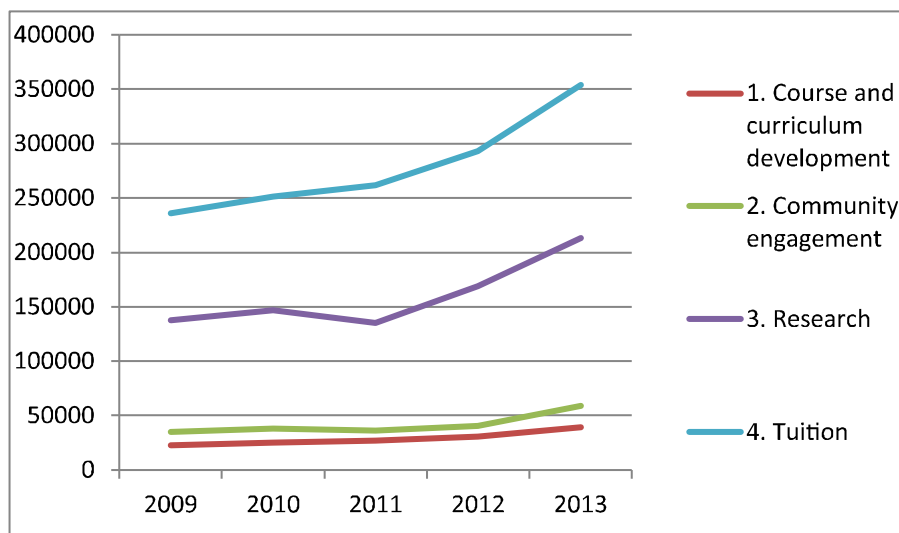


Figure 1. Core academic tasks

Figure 2 indicates the most dramatic aspect of the time capturing results, namely that there has been a dramatic increase in the Academic Administration from 2009 to 2013.

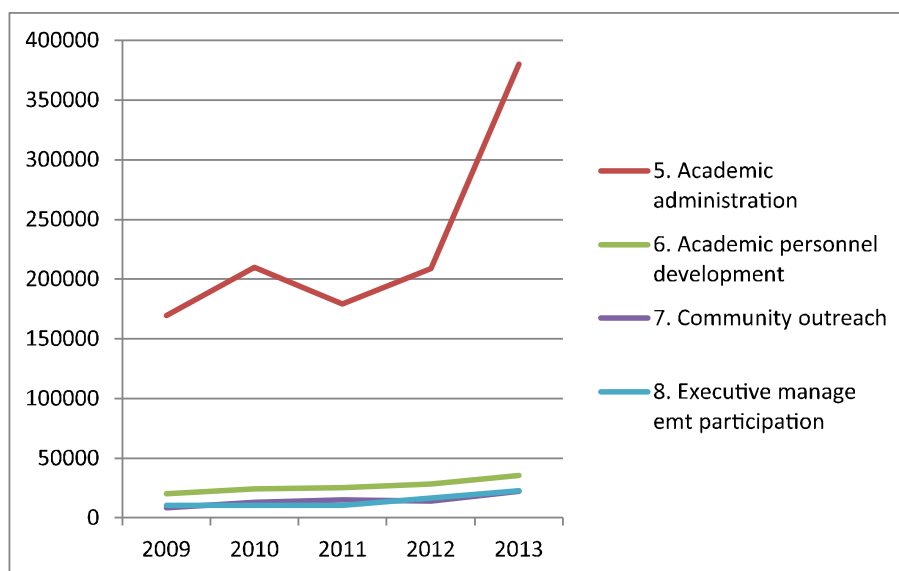


Figure 2. Academic time capturing results from 2009-2013 (Academic support)

⁵ Note that tuition is not necessarily associated with variable costs. For example, setting the annual tutorial letters is listed under tuition. It is done by UNISA core academic staff and hence classified as part of the fixed costs.

The 'Boomerang Effect': How Outsourcing Impacts on the Workload of Academics

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What is of most concern, and so noted in the du Plessis and Bester Report (2014), is that once you merge Research & Tuition in percentage terms, rather than in Rand value, and compare it to Academic Administration, Research & Tuition shows a relative decrease of 8%, whilst Academic Administration increases by about 8%.

Table 4: Tuition and Research versus Academic Administration

	2009	2010	2011	2012	2013
Research and Tuition	58.5%	55.4%	57.5%	57.7%	50.4%
5. Academic administration	26.5%	29.2%	26.0%	26.1%	33.8%

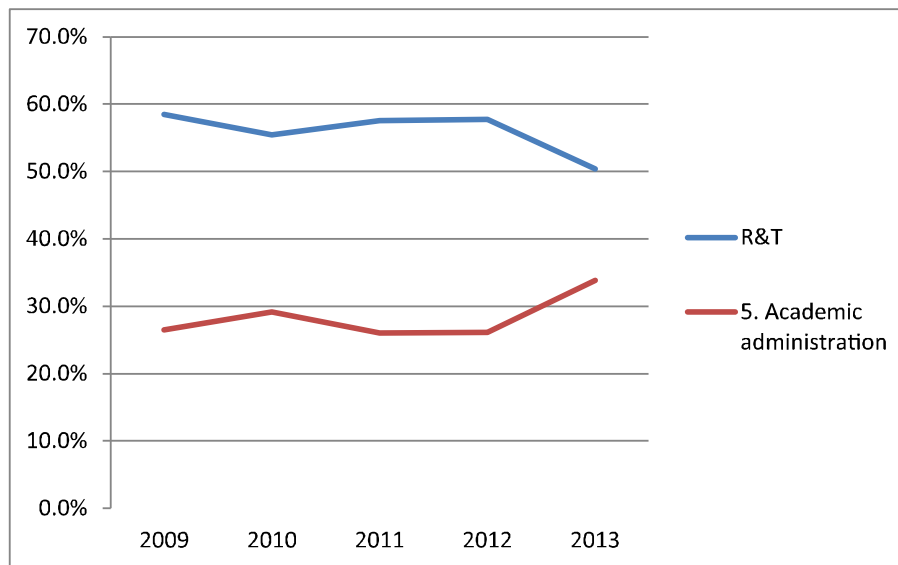


Figure 3. Tuition & Research versus Academic Administration

The findings should be a concern both from a management as well as from an academic perspective. From a management and costing perspective it should be a concern when academics find themselves allocating an ever greater part of their time to tasks not related to their core academic functions. This is likely to impinge on the quality of their core duties. Moreover, it should be a concern for any institution if peripheral administrative support activities start to outstrip the core functions (in this case tuition and research) of the institution.

What is underlying this perceived shift in the academic workload allocation reflected in the time capturing exercise? One possible explanation is based on the boomerang hypothesis. It states that UNISA under the pressure of increased enrolments resorts to outsourcing. While outsourcing indeed takes out some of the pressure, it boomerangs back as administrative tasks. The analysis of the HEDA data impressively confirms the first part of the boomerang hypothesis.

Analysis of HEDA data

The HEDA data show that the number of full time equivalents for instructional/research professional staff did increase with the full time equivalent enrolments. The FTE staff numbers went up; on average by 16%. Enrolments only increased by 6%.

This, at first sight seems to contradict our assumption that increase enrolment increases workload pressures. In fact, the student-teacher ratio has improved. While in 2009 there was one FTE staff serving 85.1 FTE students, in 2014 one FTE staff could focus on 54.2 students. Essentially, staff and student numbers expand in parallel.

Table 5: FTE staff & FTE students

	2009	2010	2011	2012	2013	2014	
FTE staff ^a	1,598	1,792	1,937	2,097	2,541	3,346	16%
FTE enrolments ^b	136,108	148,275	68,679	172,304	197,102	181,425	6%
Ratio ^c	85.1	82.7	87.1	82.2	77.6	54.2	

Source: HEDA a: FTE = Full time equivalents for Instructional/research professional staff; b: Full time equivalents enrolments; c: Ratios= Full time equivalents enrolments/Full time equivalents for Instructional/research professional staff.

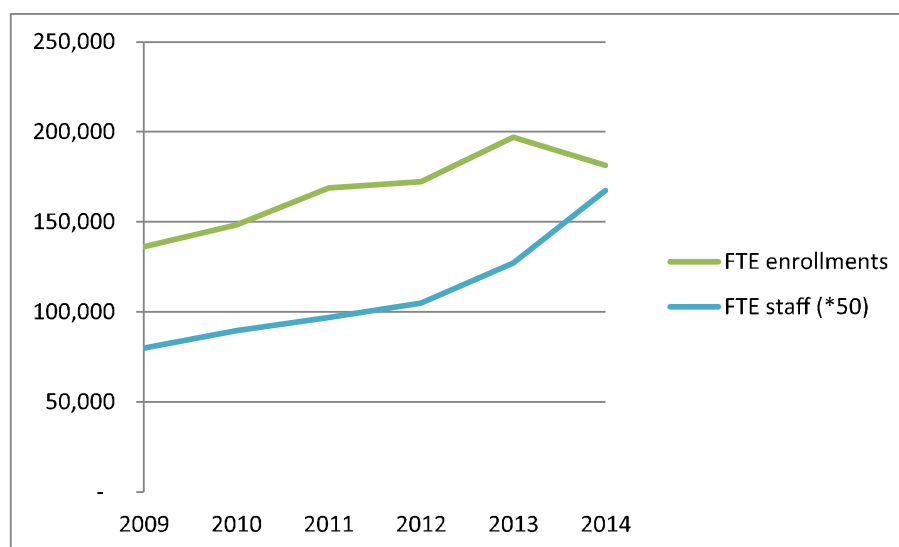


Figure 4. FTE staff vs. FTE students⁶

The overall student-staff ratio does not seem to signal increase workload pressure; but by decomposing the full time equivalents for Instructional/research and Professional staff into those employed on full-time and those on part-time basis, we come closer to the boomerang hypothesis.

Table 6: Ratios of full time and part time to total

	2009	2010	2011	2012	2013	2014
FTE ^a	1,598	1,792	1,937	2,097	2,541	3,346
Full time ^b	1,498	1,501	1,638	1,749	1,797	1,891
Part time ^c	101	291	299	347	744	1,455
Ratio full time to total	94%	84%	85%	83%	71%	57%
Ratio part time to total	6%	16%	15%	17%	29%	43%

Source: HEDA b: Most recent employed on full-time basis; c: Most recent employed on part-time basis

⁶ Note that the FTE staff is multiplied by 50. The intention here is to visualize that FTE enrolment and FTE staff develops in parallel.

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The category of staff employed on a part-time basis consists of markers, e-tutors and teaching assistants, all involved in activities contributing to the variable costs per students. The HEDA data confirm the first part of the boomerang hypothesis: there is a marked shift in the employment strategy. While in 2009 most staff members were recruited on a full time basis and only 6% on a part time basis, the composition has drastically changed. In 2014 the percentage is close to fifty-fifty.

The graph shows that the number of part-time contracts has increased much faster than the number of full-time contracts, leading to a marked shift in the composition of the workforce.

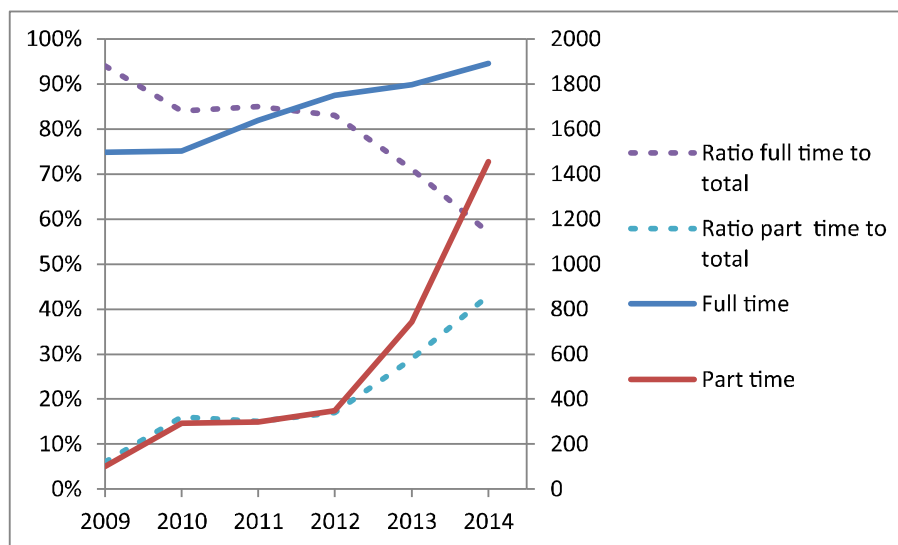


Figure 5. Ratios of full time and part time to total

The shift suggests that the increased costs related to making more use of responsive interaction at a distance, especially interaction between teacher and students, is compensated by a shift in employment practices to limit the 'damage' increased interaction does to the traditional cost structure of distance education. This is what the following table shows: due to the shift in employment conditions you can employ more staff with a C1 unit⁷. While in 2009 you could only employ 0.76 full time equivalents for Instructional/research professional staff for one C1 unit you can now employ 1.22. Hence, the shift in the composition of staff, which is at the same time a shift from fixed to variable costs, allows with the same budget to employ more staff.

⁷ A C1 value is the equivalent to a senior lecturer's salary.

Table 7: Budget implications of shift in staff composition

	2009	2010	2011	2012	2013	2014	AI(%) ^f
TB ^a	R 856,851	R 1,023,753	R 1,105,973	R 1,315,059	R 1,405,971	R 1,696,696	15%
C1 ^b	R 408,725	R 442,819	R 478,880	R 517,740	R 553,532	R 618,510	9%
Cost units ^c	2,096	2,312	2,310	2,540	2,540	2,743	6%
FTE staff ^d	1,598	1,792	1,937	2,097	2,541	3,346	16%
Ratio ^e	0.76	0.78	0.84	0.83	1.00	1.22	

Source: HEDA; a: TB = total budget (in thousand Rand); b: Academic cost unit (Rand); c: number of cost units; d: FTE = Full time equivalents for Instructional/research professional staff; e: FTE/cost units; f: average increase (%)

Does the shift in employment conditions affect the quality of the learning experience? We looked in a number of proxy quality measures (Table 6) which suggests that quality is not greatly affected. There are year by year more graduates; the success rate was improving until 2012. The considerable drop in 2013 is internally discussed (cf. Makhanya, 2014) and by some attributed to a calculation error (e.g. by including students enrolled in short term programs). Activity level of students on myUNISA is seen as a good indicator for student engagement⁸. Research output per capita has increased which could suggest that outsourcing indeed frees time for academic staff to keep up or increase their output.

Table 8: Proxy quality measures

	2009	2010	2011	2012	2013
Number of graduates	22,675	26,073	26,808	26,210	34,934
Success rate ^a	60%	63%	66%	67%	58%
Student active on myUnisa	75%	78%	83%	93%	96%
Research output per capita ^b	0.57	0.63	0.71	0.86	

Source: HEDA and Makhanya (2014); a: Makhanya (2014, p.16 Table 11); b: date for 2013 missing

The analysis of the HEDA figures tallies with what is expected from an analysis of the cost structure of distance education: variable cost per student serves as a safety valve when enrolment pressures tend to increase academic workload. Activities contributing to variable costs are associated with markers, e-tutors and teaching assistants; staff employed in these roles are typically employed on a part-time basis. The HEDA figures impressively demonstrate the shifting composition of the instructional/research professional staff to staff employed on a part-time basis, i.e. markers, e-tutors or teaching assistants.

A model-based reflection on marking

What about the second part of the boomerang hypothesis? Is it possible to show that the demonstrated shift to outsourcing leads to increased academic administration? This section is not based on empirical evidence but on modelling the effects on enrolment numbers on marking using figures and requirements from the UNISA context.

⁸ Funding depends on completing a course or module which requires completing the assignments which are uploaded to my UNISA.

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The initial conundrum is the following: Increased number of students means more marking to be done. Marking is classified as tuition hence a core academic task. The time capturing results confirm that, while tuition goes up in absolute terms, the percentage of core academic tasks decreases relative to academic administration; how could that be explained?

Applying the boomerang hypothesis to marking (as a proxy for tuition) suggests the following explanation: Increased enrolment means that marking has to be outsourced. This means that the academics' time is re-allocated to the following tasks:

- *Recruiting and appointing suitable external markers.* Some parts of this would be done by the HR department and administrative support, but the core academic staff retains responsibility for the external markers appointed to their course.
- *Training the external markers* (in the discipline content, in the outcomes required of the specific module, in the marking rubric, as well as in UNISA ICT systems such as the J-Router and myUNISA).
- *Physically or electronically moving assignments and scripts to external markers,* and receiving them back, is normally done by an administrative person, but the academic would have to supervise and take responsibility for this task.
- *Moderating the scripts that have been marked by the external markers.* The UNISA Assessment Policy requires that all 10% of all marking should be moderated by a second person. In this case, the initial marking is done by an external marker, and the moderation is done by the full-time academic.

At UNISA the term moderation is used for checking if markers do mark appropriately. Markers have neither a personal relationship with students nor do they necessarily identify with the institution. They mark for the money they receive. Hence UNISA needs to supervise if the marking has been done properly. The following table models what happens when a program increases its enrolment from 1000 to 5000 students and the departments strictly applies the UNISA moderation requirements.

Table 9: Marking and moderation model

Stud no	1000	1500	2000	2500	3000	3500	4000	4500	5000
Mark cap (# papers)	200	200	200	200	200	200	200	200	200
marking time (hrs. per semester)	50	50	50	50	50	50	50	50	50
papers outsourced	800	1300	1800	2300	2800	3300	3800	4300	4800
moderation (10%)	80	130	180	230	280	330	380	430	480
Total to mark (# papers)	1080	1630	2180	2730	3280	3830	4380	4930	5480
Marking (non moderation)	120	70	20	-30	-80	-130	-180	-230	-280
# of markers	4	7	9	12	14	17	19	22	24

The table demonstrates, based on simplified model assumptions, the effect of increased enrolments on the grading capacity of an academic. The calculation demonstrates:

- that, obviously, the initial marking capacity of the academic (assumed to be 200 papers) is quickly exhausted when you increase enrolments; this makes outsourcing marking necessary; however, the model shows further:
- maintaining marking quality of outsourcing requires *moderation*; while buffering the impact of enrolment on marking, moderation quite quickly absorbs all the assessment capacity of the academic;
- the model also suggests that you can stretch the buffering effect of moderation by decreasing the percentage of papers to be double checked (if you would substitute the 10% in the table by merely 2%);
- further increases in enrolment have to be countered by providing the lead academic with full-time academic assistants; this again comes with additional administrative workload since the academic now leads a team.

That academics interpret all this as a relative increase in academic administration and do not experience it as an increase of the core academic activity of tuition is because outsourcing protects them against having to do proportionally more marking. But at the same time markers need to be found, they need to get contracts, they must be trained. That having been done, the moderation process sets in. Without further assistance being provided moderation quickly spirals out of hand. The lead lecturer needs a team. Pushing down marking and moderation tasks to the markers and teaching assistants, the core staff remains with activities (correctly) perceived as academic administration.

The model shows allows tracing a morphing process: Marking morphs into moderation, and moderation morphs into academic administration. This can be graphically illustrated as in Figure 6 where Tuition (T) and Research (R) go down and Academic Administration (AA) goes up as Outsourcing (O) goes up (and Community Engagement (CE) remains stable).

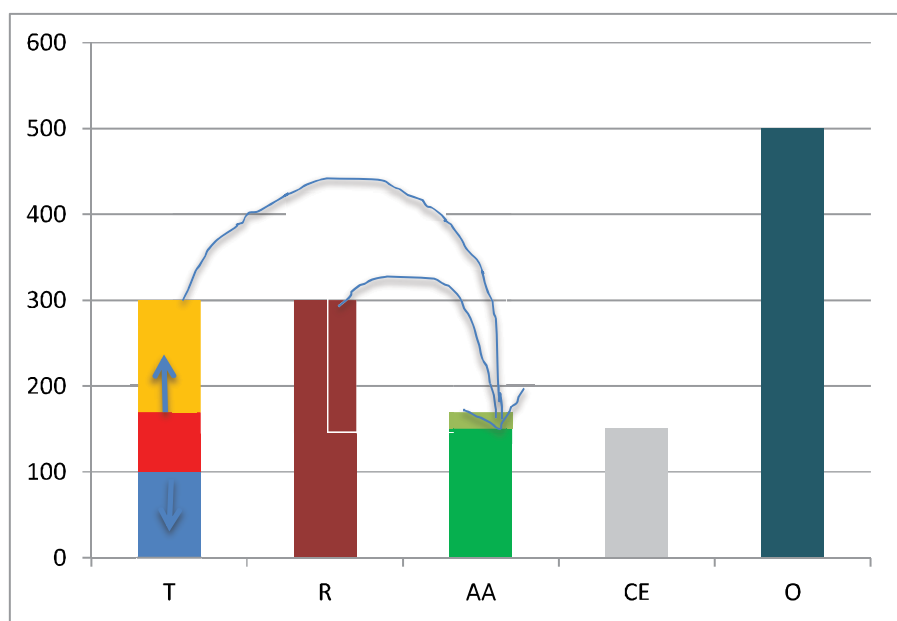


Figure 6. Ratios of full time and part time to total

Limitations and conclusions

The research question of the paper was triggered by an internal time capturing report of UNISA which reported that UNISA academics see a reallocation of their workload away from their academic core task towards academic administration. This finding gave rise to the boomerang hypothesis which includes two predictions: i) UNISA responds to increased enrolment pressures by resorting to increased levels of outsourcing; ii) outsourcing, in turn, 'boomerangs back' in the form of increased academic administration.

The data extracted from HEDA impressively demonstrate the first point. The increased level of outsourcing is reflected in a massive change to employing part time staff. This form of contract typically includes markers, e-tutors and teaching assistants.

The second part of the boomerang hypothesis would require a time capturing exercise with a specific focus on administrating markers, e-tutors and teaching assistants. By modelling the effect of increases of enrolments on stretching the departmental marking capacities, a morphing process away from the academic core task of marking (as part of tuition) towards academic administration was made plausible.

While there is a high level of plausibility of the assumption that outsourcing indeed impacts on increased academic workload the effect size to which it contributes to the perceived shift reported in the time capturing results, remains unclear. There are indeed other factors also contributing to the perceived shift. For example, UNISA's commitment to improve quality in a transparent way means that UNISA has set a number of indicators against which performance is to be measured. This leads to a considerable increase in measurement activities within UNISA⁹. All this is perceived by academics as part of academic administration. Further qualitative research in the form of focus-group interviews with academic staff is being undertaken.

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⁹ Measurement of quality may, hence, compound the problem of quality.

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We thank Willem du Plessis and Philipp Bester to make the time capturing results available and discuss them with us in the light of the boomerang hypothesis; without Liana Griesel pointing us to the relevant HEDA data not even the first part of the boomerang hypothesis could have been demonstrated.



TEACHING 21ST CENTURY ENTREPRENEURIAL COMPETENCES USING A PROBLEM BASED APPROACH

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Introduction

“Throughout the world, shifts in populations, demographics, technology changes, fluctuating economies and other dynamic forces have transformed societies as never before, bringing new challenges and opportunities to the forefront, causing interest in entrepreneurship by governments and the public” (Xavier, Kelley, Kew, Herrington & Vorderwülbecke, 2012, p.6). Youth unemployment and under-employment have become key concepts for both the developed and developing world (Herrington & Kew, 2014). Due to the financial crisis of 2011 a considerable downturn in economic growth in most parts of the world is seen, with an increase in the levels of uncertainty within the business world. These changes have a far-reaching implication for the workforce and population at large, with many activities taken over by computers with subsequent job losses and increasing unemployment statistics (Allen & van der Velden, 2012). Youth unemployment is enormous with a quarter of the world’s young people (290 million) neither working nor studying. Amongst the employed youth many young people have only informal, temporary or unpaid family jobs resulting in almost half of youngsters between the ages of fifteen and twenty four being outside the formal economy (Xavier et al., 2013).

Due to the harsh picture painted above, it has become important to re-visit the entrepreneurship education (EE) and skills debate. The inclusion of entrepreneurial competencies as a generic skill in the 21st century skills debate has never been more critical. The field of entrepreneurship and EE are gaining prominence in a changing economy. Entrepreneurship in general proves to be popular in business schools, engineering schools, universities and educational institutions (Fayolle, 2013). This study focuses on the *how* or method to transfer entrepreneurial learnings and competencies. Using PBL (project based learning) in an entrepreneurship or business classroom is one option to reach the desired outcome. Therefore, the purpose of the study is to investigate if entrepreneurship concepts and skills can be transferred using a PBL approach linked to a real life event. PBL provides the students with an opportunity to experience, to apply theory in practice and receive feedback as they develop new abilities.

The study is qualitative in nature, using a single case study to capture the reflection of student experiences after the completion of a PBL intervention. A focus group discussion was held three years later to determine the long-term effect of the intervention. The results indicate that PBL enables students to become active participants in their learning and provide an opportunity to practically experience the entrepreneurial process. Mastery of more than entrepreneurial competencies and theory were reported as benefits gained including the seven core 21st century skills (Voogt & Pajera Roblin, 2010); the seven survival skills (Wagner, n.d.) as well as life skills.

Literature Review

21st Century skills

The term “21st century skills” is widely used in education but with different interpretations (Great Schools Partnership, 2014), often as synonym for use of technology. The paper joins the 21st century skills debate in an attempt to emphasise a teaching method that is able to convey rigorous essential skills needed to assist young people to create or find employment in a rapidly changing global landscape. This is in line with Wagner (n.d.) who argues that 21st century rigour is about creating new knowledge and applying what you know to new problems and situations. The current debate focuses on adding entrepreneurial competencies as a vital skill in the current economic climate.

Entrepreneurship education (EE)

According to Fayolle (2013) EE is seen as the crossroads of entrepreneurship and education. Jones & Penaluna (2013) define EE as equipping students with the additional knowledge, attributes and capabilities to apply in the context of setting up a new venture business. There is however, a need for a clear and accurate combination of knowledge from both fields in order to come up with intellectual and conceptual models to strengthen entrepreneurship courses (Paloniemi & Belt, 2014). The constant changing world and business environment have important consequences for entrepreneurial learnings and competencies, needed to effectively function in modern societies. It requires innovative entrepreneurial competencies, thus moving away from only knowing facts to a way of thinking and acting (Gibb, 1993; Paloniemi & Belt, 2014). Tang, Lai, Chou and Chen (2014) argue that the realm between entrepreneurship activities and national economic development is inseparable, postulating that EE can elevate national entrepreneurship standards and innovative abilities of individuals. Furthermore, using a PBL approach linked to EE provides an opportunity for the development of cross-disciplinary skills (Great Schools Partnership, 2014)

For the purpose of this study an attempt is made to close the gap between what we teach and what entrepreneurs do. The window of opportunity as an organising principle assists students in experiencing the different activities an entrepreneur has to think through and overcome. It is divided into five phases namely seeing, locating, measuring, opening and closing the window (Nieman & Nieuwenhuizen, 2014). Students apply theory in practice, while learning involves the construction of a product or artefact (Helle, Tynjälä & Olkinuora, 2006; Sims,

2014). This is in line with the four different worlds on which EE can be based, namely the entrepreneur, process, cognition and method (Neck & Greene, 2011).

Project-based Learning (PBL)

EE teachers often face difficulties in finding content and methods to support their everyday teaching PBL is an innovative teaching approach getting students collaboratively and actively involved in planning, developing and accessing a project that has a practical outcome. It is also well documented that PBL has grown in popularity as an approach over the last two decades. It is widely implemented with impressive results in student achievement, problem-solving capabilities, communication and understanding, and allows opportunity for collaboration, dealing with an authentic problem and engaging with the community (Rotterham & Willingham, 2010).

This method is based on an interest or real initiative where students discuss their interest and views (giving each other advice), develop their own activity scope (planning and decision-making) and reflect on their own learning processes (Lepe & Jimenez-Rodrigo, 2014). It puts student engagement and persistence to the test, requires students to participate willingly in a meaningful activity that starts with a problem and end in a product or artefact. Students function in small groups or teams and control the learning process while lecturers act in an advisory role (Bédard, Lison, Dalle, Cote & Boutin, 2012; Sims, 2014). It helps students to develop more autonomy and responsibility as well as self-awareness about the value of these student-centred actions (Bédard et al., 2012). PBL is seen as an approach to convey both content and skill in a rich way that genuinely improves outcomes for students (Rotterham & Willingham, 2010). Linking an authentic problem to be investigated and solved in an entrepreneurship and business classroom, allows the opportunity to prepare students for the modern workplace and adult life and enhance their adaptability to function in a modern economy (Great Schools Partnership, 2014).

This leads to the formulating of the research question namely: Can theory and skills be taught using a PBL intervention in an entrepreneurial classroom.

Teaching methodology and context

The study was done in a first year business management degree course at the University of Pretoria. The duration of the course was 28 weeks, with the first 14 weeks focusing on business management as a value chain approach and the second 14 weeks focusing on entrepreneurship. The number of students enrolled for the course was 2500. The course was facilitated and managed by a senior lecturer with the help of nine lecturers. The topics covered in the course was: the nature and development of entrepreneurship; the entrepreneur, creativity and innovation; the window of opportunity, business plan; resource requirements and other important consideration when starting a business. The students had three contact sessions of fifty minutes per week. The activities used in the PBL intervention included both theoretical and practical components with the opportunity for students to plan, act and execute from their own perspective (Laurillard, 2012; Sims, 2014). The project depended on

the use of technology, to do research, use social media for student contact, as well as the LMS (WebCT) for e-learning components.

The project design followed the basic structure suggested by Larmer and Mergendoller (2010) who postulate that a meaningful project should include seven essential activities. These are (i) a need to know, (ii) a driving question, (iii) student voice and choice, (iv) 21st century skills, (v) inquiry and innovation, (vi) feedback and revision and (vii) a publicly presented product. However, reflection was added as the final step of the project design. The intervention design allowed students the opportunity to hone their entrepreneurial competencies while participating, interacting, making decisions and receiving feedback (Rönkkö & Lepistö, 2013). The design is as follows:

First as a need to know the students were introduced to the project with a case study and video, telling the story of a real entrepreneur who revived the Startas sneaker brand. All course content was based on, illustrated by and linked to this case study. The home page was designed as a continuous reminder of the project, and each time students opened the site, a funky Startas sneaker banner would move across the screen, while Nancy' Sinatra's song "These boots are made for walking" (1966) played in the background .

Second, more than one driving question was posed to guide the project and are mentioned in chronological order: design a sneaker from recycled material for an exhibition (individual assignment); raise money to pay for the white sneakers, decorations and printing cost of the pocket guide (cross-disciplinary); design a pattern for a white/ black/ navy sneaker that represents something uniquely South African; write a pocket guide that documented the process using as organising principle the window of opportunity; present the pocket guide and final designed sneakers to a panel of evaluators; reflect (written response) on their project experience.

Third an attempt was made to give students a voice and choice. Students received a study guide with all the project information, due dates for tasks to be handed in, as well as assessment rubrics to guide their progress. However, how they achieved the outcomes, how they raised money, the design and material used in the recycled shoe, the target market for the designer sneaker, the positioning in the market of the sneaker and the format and the design of the pocket guide were all according to their own planning, time table and preference. To make sure students were not financed by their parents or other personal sources, students had to present how they earned the money, as well as an income/ expense statement.

Fourth in order to enhance competencies and skills, students formed and enrolled online in groups to collaborate and work together. They communicated using social media and email; they used technology such as search engines for their research and to help find answers to the questions "who is my target market / competitors" and "where do we position ourselves in the market". The students were creative in designing the shoe, raising money, deciding on a design for the sneaker and creating the pocket guide. Students were required to do market research and to move from the idea phase to a real product. Doing market research assisted

them in deciding on their target market as well as where to position their group's sneaker in the shoe market.

Fifth inquiry and adaptability formed a huge part of the success of the project. The last contact session of each week was used to consult with lectures and peers, raise problems and concerns which cropped up during the week. The fact that these were immediately addressed, resulted in clarity of what needs to be done, eliminated stress and stumbling blocks that hampered their progress. It also allows them time to adapt if they missed certain tasks or steps. Groups posed questions via email to be addressed in class in order for all to learn and benefit from the discussion.

The sixth step required feedback and revision: Once a week during the class discussions, students received feedback on their progress to date. All questions and work were related to the given case study as well as the applicable theoretical concepts of entrepreneurship. This allowed for both theory and practise to be addressed.

The seventh step was the slide show presentation of the overall project as well as the evidence of the required outcomes (physical shoes, pocket guide, income/expense statement etc.) to a panel of lecturers and peers.

Last, reflection was added to ascertain whether the theory became concrete, tangible and applicable. Reflection as a process of engaging with learning provided opportunity for critical evaluation of learning in order to develop professional knowledge, understanding and deeper learning. It is transformational in nature, is empowering, enlightening and ultimately emancipatory Blignaut (2014). Students reflected individually on their experience of the PBL intervention after completion of the project but submitted the reflections as a group report. A focus group interview to reflect on the long-term benefits if any of the intervention was held three years later.

Research methodology

The research approach in this study is qualitative. The information gathered was used to create new patterns of understanding and share the findings for further discussions. The following procedure was followed in the research: First the respondents reflected on their project experience after completion of the project, captured in a written report. An open ended question guided the reflection. Each member of the group recorded his or her individual written response but the groups submitted the responses in as one report. Students worked in groups of five but due to logistical issues such as place of residence and transport difficulties, a few groups consisted of four or three members. Second, a random sample of 80 out of 350 groups was selected resulting in 384 perceived experiences. After 80 written reports were analysed, a point of saturation was experienced with no new information being added. Third, all sampled reflections were coded manually, reading and marking line by line to determine entrepreneurship learning and perceived skills gained. Lastly, to ensure that the research is trustworthy and transparent, the researcher had two independent researchers review the coding. Based on their reviews, refinements were made where indicated. A focus

group interview was held 3 years later with eight students who had taken part in the intervention to determine if any of the competencies gained were being used in their current working situation. The information gathered was used to create new patterns of understanding and to share the findings for further discussions. The rest of the paper deals with the discussion of findings, conclusion as well as the recommendations and limitations of the study.

Findings and discussion

The findings report student reflections and learnings perceived as benefits gained from taking part in the PBL intervention, analysed qualitatively, using the four worlds of EE as suggested by Neck & Greene (2011) as organising framework to determine if this intervention covered the four worlds of EE.

The first component of the four worlds of EE deals with the *method of teaching* entrepreneurship. Students reported positively on the PBL as a teaching method in entrepreneurship. Students mentioned that they gained much more from this project than any other theoretical course. It was practical, helped them to **understand** and **embrace diverse cultures**, improved their **communication and interpersonal skills** and improved their ability to **solve problems** and **work together** in a team. Students reported: “We were **curious to learn and experience** more” and “After completion of the project we could not believe how wild our **imagination** has run”.

The second component deals with *the entrepreneur*. Students reflected on the experiences of being an entrepreneur and stepping into the shoes of an entrepreneur. They mentioned developing an **entrepreneurial mind set**; of having a better **understanding and insight in the entrepreneur** and **the entrepreneurial processes** as well as some **entrepreneurial traits** such as hardworking and persistence. Doing the presentation made them aware of how important **public speaking** is to pitch their product or talk to financiers. They also experienced challenges: “It was difficult to **manage our time** spent on the project and our other subjects” and “**Raising money, doing our income/ expenditure** and staying within **our budget** were all eye openers”.

The third component deals with the *cognitive world* of EE. Students reflected on learning about the **content** of entrepreneurship while doing. They argued that the **practical experience and application** made it easier to understand the **theory and concepts** driving entrepreneurship and what entrepreneurship in general is about. Using **critical thinking** to do **research and access information**, find their **target market**, doing **research and positioning** their product gave them better understanding and **practical experience of difficult theoretical concepts**.

The last component of the world of EE involves the *entrepreneurial process*. The project was linked to the window of opportunity as the organising principle to guide students through the steps and tasks of the project. Students reported that the **window of opportunity gave them a**

tool to learn about the tasks needed to open a business; gave them **a clear business system to experience** and **understand the entrepreneurial process**. After making mistakes, they adapted: “Although we made **many mistakes** and had to **start over and adapt** and being **innovative and creative**, we persisted”. They recognised new potential: “Doing all the activities in the entrepreneurial **process opened our eyes for the opportunities** around making us **alert (agile)** to possibilities”.

Both content and skills were reflected upon. Students’ reflections of perceived benefits of the PBL intervention did not only include entrepreneurial learnings and competencies but also the seven core 21st century skills (Voogt & Pajera Roblin, 2010) as well as the seven survival skills (Wagner, n.d.). Working together and dealing with their emotions, the improvement of their communication skills, critical thinking, ICT skills, creativity, problem solving as well as social and cultural skill, agility, accessing information, curiosity, imagination, adaptability and many more were mentioned as well as life skills. However, though these skills were identified in the reflections, it is not the purpose of this study to probe deeply into 21st century and other skills.

The outcome of the focus group confirmed that the intervention had long-term benefits. Two of the respondents were self-employed and mentioned that doing the project developed their ability to scan the environment and look for opportunities. They also referred to their ability to take calculated risks because they understood and experienced the entrepreneurial process. One of them mentioned that he still uses the window of opportunity as a guiding principle. The other six respondents were working in the formal employment sector. They mentioned the benefits they gained from working in a group, understanding others, adapting to new situations and their ability to critically look at their environment and work content. One mentioned her ability to plan, organise and execute because of the lessons learned through the many project tasks and the time limits experienced. All of them said that they constantly look for possible opportunities to start their own initiatives.

The study therefore concludes that a PBL approach in an entrepreneurship classroom tick all the boxes for covering the four different worlds on which EE is based. Students reflected on the PBL approach (method) as well as the entrepreneur, entrepreneurial learnings and competencies (cognition) and the entrepreneurial process, as indicated by underlining of key concepts that overlap with the four EE worlds. Some of the topics covered included creativity, managing time, work-life balance, trying again after failure, persistence, working together and managing group emotions and problems. This is in line with Fayolle (2013) who argues the need for the incorporation in entrepreneurial practices of softer entrepreneurial topics such as entrepreneurial mind set, opportunity construction, work-life balance, managing emotions and learning from failure. Many other competencies were also mentioned such as raising money, staying within your budget, book keeping, embracing different cultures which confirm that the PBL intervention in entrepreneurship can achieve cross-disciplinary skills needed in the twenty first century.

Entrepreneurial competencies as part of a skills set to prepare students for the twenty first century workplace and job creation in the current global economy has become evident over the last twenty years, as described by 7 generic skills and 7 survival skills. More important is the teaching method to cover both content and entrepreneurial competencies so needed in a fast changing economy and the world of work. The PBL approach in the entrepreneurship classroom and EE can achieve entrepreneurial learnings and competencies as well develop generic cross disciplinary skills needed to succeed and function in the 21st century working environment. Based on the above support is presented for the research question: “Can entrepreneurship theory and skills be taught using a PBL intervention in an entrepreneurial classroom?”

Conclusions and recommendations

The value of the PBL intervention reaches far beyond the classroom and gives the students valuable insight into the action, processes and activities of an entrepreneur. Therefore, using an innovative PBL approach has the ability to assist students to develop an understanding of the entrepreneurial process while also nurturing competencies needed for their future working lives. However, the basic objective of EE is to create an awareness of entrepreneurship and entrepreneurial thinking to enable individuals to consider self-employment as an option. The study concludes that a PBL approach linked to a real life problem gives the students an opportunity to hone their entrepreneurial competencies while they participate, interact, make decisions, work together solve problems, take risks, research, accept mistakes but also receive feedback (Rönkkö & Lepistö, 2015). Linked to the suggested project design (Larmer & Mergendoller, 2010) and the EE teaching model (Neck & Green, 2011) the PBL intervention in an entrepreneurship classroom not only gives an effective method and teaching pedagogy (how) to achieve both entrepreneurial learnings and competencies but also nurture generic and survival skills across disciplines.

The study has implications for both educators and practitioners. A PBL approach linked to an authentic task benefit students by exposing them to the world of work and practice. It can be applied across disciplines and is therefore ideally suited in many higher education subject areas. It also helps students to understand and develop not only content but also 21st century skills needed in today's competitive working environment. The study confirms the notion that education is capable of making a significant contribution to the development and empowerment of individuals to ensure a well-rounded worker enters industry.

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DESIGNING APPLICATIONS TO SUPPORT MOBILE WORK BASED LEARNING IN THE CONSTRUCTION INDUSTRY

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Introduction

One of the greatest potentials of technology enhanced learning is to provide access to groups with previous limited access to education. Yet there has been a tendency provision for learning through technology to be focused on those already in education, rather than extending access. Research suggests that even those enrolling on MOOCs tend to already have a degree. Despite projects targeting the development of technology enhanced learning for the unemployed, for socially excluded groups or for workplace learning, particularly in small and medium enterprises, these have seldom resulted in sustainable products, programmes or innovations.

There have been many discussions as to why this might be. Ideas put forward include lack of access to infrastructure and hardware, lack of learning materials, lack of learner motivation and lack of funding for sustainable initiatives.

This paper focuses on the use of technology for (mainly informal) learning in Small and Medium Enterprises in the construction sector. It is based on work being undertaken by the four years EU IST programme funded Learning Layers project. The project is aiming to develop large scale take up of technology for informal learning in two sectors, perceived as lagging behind, the health system and construction. The consortium includes research and development partners from European universities and SMEs including two application partners, BauABC and Agentur, from the construction industry in north Germany. Agentur is a small organisation concerned with sustainable construction; BauABC is the largest industrial training centre in Germany providing training for over 7000 apprentices as well as continuing professional development programmes.

The project includes both research and development strands, aiming to facilitate and support the development, testing and deployment of systems and tools for learning. The wider goals of the project are to develop sustainable models and tools for supporting learning in other countries and sectors. This paper describes the outcomes of empirical research undertaken in the construction sector through the project as well as the co-design process contributing to the development of Learning Toolbox, a mobile application being developed for apprentices in the construction sector. The empirical research has been undertaken with a wide range of

stakeholders in the construction industry, including surveys of apprentices whilst the co-design process has focused on trainers and apprentices from the two application partners.

Work based mobile learning

A design workshop help early in the project identified a number of design ideas for initial exploration and development.

One of these, code named Sharing Turbine, focused on the use of mobile technologies to bring together informal and formal learning by construction industry apprentices in the different contexts of the training centre, the vocational school and the workplace. Whilst working conditions inhibit the use of computers in the training centre and the workplace, mobile devices are already widely used as part of the working process in construction. Furthermore, initial suggestions suggested the potential of multimedia and particularly video in the sector, with many do it yourself videos already available on sites such as YouTube.

However it was recognised that there were different pedagogical approaches to working and learning and limited understandings of how processes of work in construction would impact on such approaches. Indeed it was suggested that it is impossible to understand how such solutions could be implemented successfully in a specific sector or area of business without understanding the field. According to Weaver-Hightower's (2008) this approach towards field understanding includes four categories:

- Actors;
- Relationships;
- Environments and structures;
- Processes.

Any use of mobile technology in and for work depends on the very specific situation and general conditions within a business sector. Hence research and development for mobile digital media includes both peoples' needs and practices as workers and learners as well as specific business challenges, directions of development and needs concerning knowledge, skills and competencies. Testing and guiding the introduction of such solutions in enterprises and organisations could be understood as one kind of action research (Gstettner, 1995).

A further concern was that in innovation research, as compared with technology development in education, it is crucial to understand the importance of business perspectives. Change is expected to result in better and/or more efficient products and services. Enterprises are more focused on work processes than on learning and the use of mobile technology or digital media within the work context influences professional action, social behaviour, required competencies, work process organisation and organisational structures (see Evans, 2011). Enterprises are concerned with the possible cost of change. Thus in researching and developing mobile learning applications and digital media for use in Small and Medium Enterprises it is important to examine the possible impacts on employees and work processes as well as just the impact or potential for learning.

Researching in the field: aims and methods

The Learning Layers project is based on a process of iterative co-design, bringing together end users in the construction field, together with researchers and developers. One of the main aims of the initial research undertaken was to collect learner stories as a prelude to developing persona as part of the co-design process. Over 50 semi-structured interviews were undertaken with different stakeholders in the construction industry in north Germany. These included large enterprises, SMEs and craft trade companies, chambers of trade, industry associations and the construction industry training centre.

The interviews were designed to address a series of research questions including:

1. How do employees in the German construction industry perceive their current professional usage of mobile devices and tools?
2. What are their views about the future potential of technology enhanced learning and information management tools?
3. What is the relation to work process organisation?
4. Can technology based tools be used for (informal) learning?

The conduction and analysis of the interviews followed the open but structured procedure described by Witzel (1982), which means that there were a number of questions prepared, but the interviewees' narrative flow had priority. The interviews were summarized individually and in a second step common contents were collected and statements compared. Additional literature was used to understand some of the background to the narratives.

Research findings

Digital media in work and learning

While most teachers and trainers in Vocational Education and Training in Germany avoid using digital media in teaching (Lübcke & Burchert, 2013), employees and managers in construction related occupations had disparate attitudes towards the use of technology and digital media for learning. Some expressed fears and doubts while others spoke about their hope that the use of technology could lead to changes in professional behaviour. Some formulated concrete ideas for tools. We differentiated four lines of argumentation with i) anxious-avoiding, ii) critical, iii) optimistic and iv) pragmatically oriented ideas around the implementation of new media.

Typical anxious-avoiding arguments are concerns that the work conditions in building sites would quickly destroy technical devices and even that workers' fingers are too chunky to deal with small keypads.

On the side of critical arguments we found two main lines. On the one hand the environmental problems caused by the production, use and disposal of smart phones and tablets were emphasised. On the other hand the organizational changes caused by digitalisation are regarded as not always useful (resulting for example in information

overload) or even as a threat to working conditions. A further concern was that technical innovation could be used as a means to increase work pressure and managerial control.

In addition, several interviewees from these two groups were sceptical that digital media work be useful for their practical – mostly manual – work.

In contrast, the optimistic and pragmatic interviewees, who often seemed more familiar with Information and Communication Technologies and mobile devices, had a clear idea of how to use technology in their work places. They pointed to the advantages such technologies could bring including the comprehensive documentation of work, the enhanced coordination of work processes and the potential both to avoid mistakes and to improve quality. While the pragmatically oriented interviewees tend to look at using technology for dealing with everyday work, the optimistic group also point to innovative, not yet implemented modes of use. A number of senior managers felt that the use of mobile devices and digital media would improve the image of the construction industry, especially to young people. This was seen as important as the industry struggles to attract sufficient well-qualified applicants.

Both perspectives point to a changing world of construction, in which work pressure and the demand to document work rise. It was noted that mobile devices are increasingly being used to produce a photographic record of construction work, as part of quality assurance procedures.

Digital media in a changing construction sector

There are different aspects to on-going change in the construction sector.

At the level of tasks, those interviewed reported increasing complexity in the construction industry with the use of innovative technical devices, materials and processes. For example heavy plant machinery used for road construction is increasingly incorporating advanced technologies including satellite connections and digital recording of operations. Apprentices and craftsmen need to understand how such technical tools are working, on what the technical calculations are based and how the things they execute are embedded into the construction process as a whole.

Project and team based work organisation is increasingly replacing more traditional hierarchical organisational structures. Rather than information and knowledge being the prerogative of a site foreman, it is now distributed through the team, often using digital processes for management, planning and evaluation. Computerised Building Information Management systems are being introduced as a tool for managing and documenting construction work.

Some in-company trainers and teachers use Facebook and WhatsApp in order to support their apprentices and deal with problems – be it school related or private problems.

At the level of the construction industry supply chain, suppliers of materials and machines have moved to digital ordering and support processes. Oral interactions are being replaced or

amended by the use of digital photographs, videos, digital blueprints etc. The interviewees mentioned many examples of learning and teaching manuals that were provided online by companies and company associations.

At the level of cultural habits and practices, perhaps most important are the changing expectations of new workers who have grown up in a digital society. For many the use of digital devices and new media is natural and obvious. This includes especially the use of smart phones for communication and sharing problems and issues through photographs. is self understanding and easy. However some employers do not officially allow the use of such technologies fearing it may be time wasting.

Being aware that digital devices are already a part of the working life, we asked our interviewees about their ideas for the further development of such tools to support work and learning.

Ideas for digital tools to enhance work and work-related learning

Although many were enthusiastic about the increased use of mobile devices and digital media there were few ideas of what applications might be developed. One suggestion was the development of mobile apps providing information about occupations in the construction sector. Although such information is already available on the internet, it was felt that more young people might access it on a mobile app.

Another common idea was the increased provision of videos for example providing information about innovative materials.

There was pronounced scepticism towards what was termed as “VET researcher fantasies” for instance in developing g knowledge exchange networks. Companies were not prepared to share knowledge which was seen as giving them a competitive advantage over others. Doubts were expressed as to the use of a digital portfolio to replace the existing paper based portfolio required of apprentices. Whilst it was recognised that many apprentices do not like the amount of wording involved, merely replacing this with typing on a small keyboard was seen as of limited value.

This lack of ideas to design learning tools may be related to the traditionally formal vocational training system in Germany. There is a common perception that professional competences/qualifications are developed through basic apprenticeship training in the initial vocational training programme and further career development is available through state-defined formal educational courses (e.g. Meister, Techniker). Also, for many workers in the construction sector, knowledge is not easily exchangeable, but something that needs to be “inscribed in flesh and blood”. Although informal learning happens continuously at work by solving problems, adjusting work organisation, making and sharing experiences etc., it is not defined or perceived as learning.

The initial interviews were followed up with a survey of apprentices was undertaken with over 700 first, second and third year apprentices completing the survey. The survey confirmed the desire for more use of mobile learning resources and a frustration with the limitations of existing commercial applications. Whilst only a limited number of companies permitted the use of mobile devices in the workplace, 53% of apprentices said they used them for learning or for obtaining work related information, explaining this was in their own times in breaks or after work.

The results of the research resulted in the development of a number of personas. The results, together with the survey findings were also the subject of a series of workshops with trainers from BauABC as part of the co-design process for Rapid Turbine and later the Learning Toolbox. This is described in the next section of this paper.

Three iterations – from Sharing Turbine to Learning Toolboax

Sharing Turbine

The design idea for “Sharing Turbine” emerged from the Learning Layers Design Conference held in Helsinki in March 2013. The idea was to digitise the White Folder – the collection of instructions and worksheets with which the apprentices at the BauABC construction industry training centre work during their training periods in the centre. Currently the tasks are delivered and documented with papers collected in a physical folder. This was seen by trainers and apprentices as inflexible and difficult to use in the context of construction sites. The development of a digital White Folder, accessed through a mobile application, was seen as linking informal and formal learning and learning taking place in different venues, in the training centre, in the vocational school and in companies. Initial development included design workshops with the Bau-ABC trainers and the development of wireframes as well as lengthy and in depth conversations with both apprentices and trainers regarding the pedagogic use of new technologies for informal learning.

Rapid Turbine

The second phase codenamed “Rapid Turbine” was launched in summer 2013, with the aim to focus on selected pilot areas (road-building, pipeline-laying) that had indicated interest in serving as pilot areas and to use multimedia and video material in their training. The work in this phase was based on workshops involving both trainers and apprentices. The results were captured by producing wireframes and a clickable prototype, based on digitalisation of one task in the White Folder. At the end of this phase, an interim evaluation was carried out in the development team and discussed in meetings with Bau-ABC management and trainers. It was concluded that:

- The work of digitising existing materials was extremely time consuming.
- There was a need for more flexibility in designing applications which can be used in different learning contexts - taking into account different working environments.
- There was a need to develop tools and workflows that would allow trainers themselves to produce learning materials.

- There was a need for closer integration between the Application frontend development and the social semantic server, acting as a back end, which was being developed for use on the Learning Layers project.

Learning Toolbox

The evaluation of Rapid Turbine led to the development of a third iteration, called Learning Toolbox. Learning Toolbox is designed as a comprehensive framework that can be used for apprentice training and continuing training as well as for other services for the building and construction sector. For craft trade companies the interest in web tools and mobile technologies does not arise primarily from the context of training. Their key concerns are related to real-time, knowledge sharing, communication and problem-solving. The experiences with earlier web tools have shown that they do not necessarily contribute to optimisation of work and business processes. However, flexible framework solutions like the Learning Toolbox can be customised to their needs. Supplier companies (e.g. vendors of machinery, equipment and material) have an interest to customise their user guidelines, maintenance manuals and instructional media for different users. They also need to develop real-time feedback mechanisms to improve their error control mechanisms. From this perspective they have also shown interest in the functionality of the Learning Toolbox.

The initial wireframes and clickable prototype for Learning Toolbox have been the subject of wide consultation with different stakeholders including:

1. Trainers from Bau-ABC.
2. Apprentices in the north Germany construction companies.
3. Materials and machinery suppliers.
4. SMEs and larger companies in the construction sector.

Learning Toolbox integrates the different tools and applications that are being developed in the Learning Layers project. It provides flexible access both to customised tiles (tiles are interfaces to tools providing different functionality, but accessed through a single mobile interface, the toolbox) and to tiles accessing other Learning Layers applications. Initially, the co-design and development work for the Learning Toolbox was launched with Bau-ABC and as a response to specific needs in the construction sector.

At a technical level the complete Learning Toolbox (LTB) will have two front-end applications: the Learning Toolbox App and the Learning Toolbox Tilestore. Both will be serviced by the same RESTful but stateful back-end Learning Toolbox API. The Learning Toolbox Tilestore is meant to create, edit and share so-called Stacks. A stack is a multi-paged predefined set of Tiles that are meant to be used together in a specific context or situation. The user can use the LTB Tilestore to find, create or repurpose the Stack they need and make it available for use in their LTB App. In the LTB Tilestore, each Stack has a unique URI to make them easily retrievable by the LTB App. The loading of specific context related Stacks in the users LTB App can be invoked through QR Codes and later possibly sensors or geo-location.

Tiles can be defined to have various tasks: access to other Learning Layers applications and third-party apps, to integrate different functionality, access useful resources, access to and interaction with learning materials, help seeking, social networking videos, navigation to other pages or other Stacks and a wide range of different functionality depending on context of use and learning needs. The first release of Learning Toolbox is planned for March 2015 and there has already been considerable interest in the application from different sectors, including health care and engineering.

Interim conclusions

The Learning Layers project plans a large scale roll out of the Learning toolbox over the next two years with an extensive evaluation programme and further consultations with stakeholders including, most importantly, end users. It is only then when we will be able to conclude whether the design ideas and design processes have succeeded. However the design process and the accompanying research allow us to present a number of interim conclusions.

First, the use of mobile technologies and digital media for work based learning can greatly expand access to Technology Enhanced Learning to new learner groups. However this requires a move away from seeing mobile learning as predominantly a push technology and instead focused more functionality for communication and sharing and creativity in the workplace. Mobile learning should not be seen as a replacement for face to face learning and work based learning activities but rather as enhancing such a learning approach. Functionality needs to reflect and enhance work based activities and as such to be integrated into work and business processes.

For such design activities co-design is not a luxury of a research experiment. The full involvement of trainers and learners is needed in order to fully understand the work and learning undertaken and integrate Technology Based Learning with pedagogic approaches within the sectors. Equally it is probably impossible for e-learning developers to themselves produce learning materials due to the knowledge required of occupational work and learning. Neither is the digitalisation of existing analogue materials a particularly useful approach. Thus mobile learning tools require functionality, approaches and work flows to allow trainers to easily produce digital media themselves, and to allow learners to share their own learning as part of a digital ecology.

Thirdly the implementation of Technology Enhanced Learning in Small and Medium Enterprises will require capacity building in organisations, networks and sectors. This includes the capacity of trainers to support pedagogically the implementation of technology for learning, the development of technical infrastructure and the capacity of organisations and managements to support the use of technologies.

Finally is the importance of context in work based learning. Mobile learning applications need to be able to adapt to different contexts. These include, but are not limited to, the context of what kind of work are being undertaken, different forms of work organisation and different locations and forms of learning. In the case of Learning Toolbox, the application is

particularly designed to bridge formal and informal learning and to take account of the different contexts of learning in the vocational schools, learning in the industry training centre and learning on the construction site.

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BUILDING AND MAINTAINING OPERATIONAL SKILLS DURING COMPLEX CHANGE – A WORLD BANK GROUP STAFF LEARNING CASE STUDY

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Introduction

In response to a rapidly changing organizational environment, the regional learning coordinators of the World Bank, with the support of their management and teams, launched a highly successful global clinic series to keep staff up to date on operational changes through a centralized learning approach¹. With a diverse staff in over one hundred countries, different time zones and a never-ending stream of national holidays, this was somewhat of a challenge. Within 6 months of commencing the series staff from 92 countries and from across all regions had attended at least one clinic. Overall, 34 percent of these participants were based in World Bank country offices. Three key components made this plan possible and included a new outreach strategy, a plan to rapidly produce materials using cutting edge content, and a new content repository strategy. Early evaluation evidence is presented below. There were a number of expected outcomes from the newly focused clinic series and also some unexpected outcomes which are explored below.

Rapid and ongoing organizational change

Beginning in 2012 and continuing until the present, the World Bank Group has been going through a lengthy process of rapid change. This includes a new president and senior management, new organizational structure, operational reforms, new IT systems and changing policies. Combine this with a rapidly changing world, and a renewed mission of ending extreme poverty in a generation while ensuring greater equity within client countries, and many people needed support to stay abreast of this. In fact major publications including the New York Times (Lowrey, 2014), Financial Times (Donnan, 2014) and the Economist (Editorial, 2014) have all commented on the rapid pace of change within the organization.

¹ The International Bank for Reconstruction and Development (IBRD) aims to reduce poverty in middle-income countries and creditworthy poorer countries by promoting sustainable development through loans, guarantees, risk management products, and analytical and advisory services. Established in 1944 as the original institution of the World Bank Group, IBRD is structured like a cooperative that is owned and operated for the benefit of its 188 member countries.

During 2013-14, greater pressure was directed at making sure that World Bank Group operations were achieving intended development results effectively and efficiently, which is often referred to as project quality. This effort required staff to keep ahead of a plethora of revisions to operational policies and practices while at the same time maintaining the specialized, technical excellence required by clients. Staff also contended with busy work and travel schedules with many staff travelling up to 60 days per year on business.

Historical approaches to learning and adapting to change

In the past, one of the key ways that staff kept abreast of new technical topics and changes was through attending “Brown Bag Lunches.” During these lunch-time events, staff would listen to various speakers on a range of topics, ask relevant questions, and identify a go-to person to help with specific issues. But over time, these BBLs were deemed insufficient in addressing specific operational questions. In response, quality assurance staff began to hold additional “clinics” which were far more problem focused and/or supported walk in operational advice. As the World Bank became more decentralized with growing numbers of staff based in country offices, the country office staff would frequently cite lack of access to the same information available to Washington-based staff as a performance impediment.

By 2013, each of the Bank’s six regions were regularly holding clinics and BBLs – some by webinar – which were mostly directed toward staff working in the region and led by staff from the same region. This approach began to address the access concerns of country office staff. Clinics covered a range of topics with significant regional variation and were usually offered based on the availability of a speaker/presenter. At the request of management, the Regional Learning Coordinators² (RLCs) began to coordinate to share topics and a collaboration site was set up on *Spark* the Bank’s social collaboration platform for this purpose. Each RLC took responsibility for a certain topic and worked with a regional subject matter expert to create reliable content on the topic. The content was then vetted by the other subject matter experts and RLCs. By the middle of the year, a small body of quick operational learning topics was available.

Breaking down silos and a new approach to learning

For years, many cited the World Bank’s internal structure as heavily bureaucratic and “siloed”. The new president was quoted by the Financial Times explaining, “We found we’re really working as six regional banks because knowledge wasn’t moving from one region to another.” (Harding, 2014) This structure created “Learning silos” as well. RLCs reported to a Regional management, not to a central Human Resources or training department. Each managed a separate regional budget and plan for the design and delivery of operational training to the staff of their specific region, yet World Bank operational policies and procedures were similar across the organization.

² Including the three authors of this paper and others.

With the organizational change that occurred in July 2014, much of the audience for operational training was moved organizationally (not physically) out of the six regions and into one of the new fourteen Global Practice groups. A decision was made to retain the learning function within the Regions during the transition year. With the primary target audience now dispersed under different units across the World Bank, still coupled with its geographic disbursement across the globe, the Regional Learning teams put aside regional affiliation and strengthened their collaborative efforts in order to ensure staff could continue to receive necessary training while maximizing the new economies of scale.

As the organizational changes came into effect, the RLCs and the Bank's Operations Centre started to collaborate closely on the most effective way to reach out to both country office and headquarters staff, and to also ensure the quality of learning offerings. This led to the development and branding of the *Global Operational Clinics* as a collaborative effort between the regions and the newly formed Global Practices which housed most of the Bank's technical staff, including such staff as water engineers, climate change specialists and poverty economists.

A new learning outreach strategy and expanding access

RLCs determined that through collaboration they could reach staff from more than 100 countries on a regular basis with synchronous training. This collaboration began with building one "global" schedule of clinic that would meet the needs of all participants. The regional learning teams agreed to share the responsibilities of delivering clinics at various times of the day in order to reach staff across the world during their regular business hours. This means clinics are held in Washington at 7:00, 9:00, 14:00 and 21:00. Additionally, each clinic is delivered to both face-to-face and webinar participants. By utilizing a common web-based webinar platform, Adobe Connect, staff can choose to participate from the office or from home during one of the clinic times that is most convenient to them and they can also connect using a mobile device even when travelling. Keeping virtual participants engaged is vital to the success of the clinics, so the clinics were delivered with the support of a producer working behind the scene of each live session to ensure flawless delivery of the events (Christopher, 2015). Figure 1 shows an example of a producer paired with a subject matter expert delivering a clinic.

The new schedule provides a suitable clinic time for every country office. Previously, under the regionally-based clinic series, some countries could not take advantage of the training merely due to the delivery time. For instance, the office in Almaty, Kazakhstan, has no overlapping business hours with Washington, and only a few common business hours with other cities in the World Bank's Europe and Central Asia Region. It was not cost-effective for the Region to hold a clinic just for the staff of one country office. But, with the new global clinic schedule, staff in Almaty can participate in the training with staff in Beijing and other cities in the East and South Asia Regions in a cost-effective manner. The learning and knowledge sharing that is achieved in the global clinic series now benefits from a broader

participant base that is cross-regional, and cross-sector in the experiences they bring to the “classroom.”



Figure 5. A typical webinar setting with producer and subject matter expert

Rapid production of standardized learning materials

Another benefit of the “global” clinic approach is the development of standardized content. No longer does the Bank have six different learning teams, working with six different subject matter experts, spending six times the funds in staff time alone, to develop the same content. In the new approach, the learning content is codified and managed collectively which is an appropriate knowledge management strategy in this organizational context (Davenport, 1998; Argote, 2006). Each learning team has the responsibility for the content of a few selected topics. The learning professionals work with one or two subject matter experts to develop the clinic materials and ensure institutional vetting of the content for alignment with policies and procedures.

Previously, with the highly decentralized approach to operational training, the smaller Operations Centre was usually unaware of the various training being provided across the organization and therefore unlikely to have seen the materials developed and presented. The content of the clinic materials relied solely on the trainer’s current knowledge and preferences. The operating environment at the World Bank is dynamic with new policies and procedures being continuously implemented. Was training addressing the most recent policies and procedures? Were the correct corporate messages being shared? Were the correct issues being raised? There was little quality assurance performed. Now, with the centralized approach, it is the responsibility of the Learning teams to partner with the corporate content owners to develop and vet the clinic materials, ensuring a reduction in misinformation. A standardized set of clinic materials are developed on each topic and trainers are provided these materials before each delivery.

With only one set of standardized materials to use, the quality of these materials can be more easily maintained. From a pedagogical standpoint, a learning professional can review the materials to ensure key learning objectives are covered, the scope is appropriate for a short, web-based clinic, and participant engagement activities are embedded in the delivery. Additionally, the materials can be checked for basic clarity and readability standards, utilizing appropriately sized fonts, colours, and layouts for a more effective user experience.

Another benefit of establishing standardized materials is the time this frees up for the subject matter experts (trainers). Prior to the implementation of standardized materials, each trainer had to spend time developing their own presentations on basic topics. This newly available time is allowing the learning teams to work with the experts to look beyond the current clinic content into new topic areas, enabling the Clinic series to grow and expand. Additionally, World Bank staff often request training materials to present to clients or other interested parties to build capacity for their staff. Once one regional team updates materials on any given topic, it is now relatively simple for any region or global practice to access the latest version on any common topic and modify it slightly for a different audience.

Building New Institutional repositories

The process of sharing content across regions has led to the development of a new institutional document repository and collaboration site. The repository is centrally housed and allows all regional teams to store and access materials and digital recordings of clinics even on mobile devices. By centralizing learning materials and storing them in digital format, both subject matter experts and staff benefit.

Previously, content for operational training was scattered, it was stored on hard drives, in shared drives accessible by one region but not another, and in email inboxes. This decentralized approach created inefficiencies since regions could not benefit from collaborating and sharing materials with each other. Once materials were centralized, subject matter experts and regional learning teams also had access to the most recent version of materials.

Staff also benefited from centralizing materials. They can search online and discover materials on topics at the moment in time when they needed to learn. By continuously giving staff access to up-to-date learning materials and recorded presentations, the demand for subject matter experts is better managed because staff knows that current materials are online, and do not need to request this from an expert.

Centralising materials also presented a set of challenges for the regional learning teams. In order to make the knowledge assets (materials) accessible, it was important to develop the taxonomy that reflected how people in the organization would browse and search for content (Rosenberg, 2006). This required reaching agreement on content categories that matched the content topics in the corporate learning management system and content types such as slides, hand-outs and recordings. Finally, naming conventions were designed to keep content

organized so users could quickly locate the latest version of materials. These standardized materials are then stored centrally in *Spark*, the organization's social collaboration platform, and are accessible to any learning team to use either "as-is" or to supplement with their own examples or case studies.

Expected outcomes

The results of this collaborative effort to offer Global Operational Clinics included major improvements in the participation of various groups and in overall communications. As shown in Figure 2, the majority of participants were professional-level staff. This busy group often does not have time to attend a multi-day training session. However, they embraced the shortened format on targeted topics. Additionally, policies on who could attend training had prevented consultants from attending face-to-face training. This portion of the World Bank workforce still need training however, and the clinics solved this problem as twenty three percent of clinic participants were consultants. The third group, administrative staff, has benefited through clinics by updates to procedural changes while also gaining a better understanding of issues that impact the task team and organization, and through the opportunity to learn alongside more senior staff.

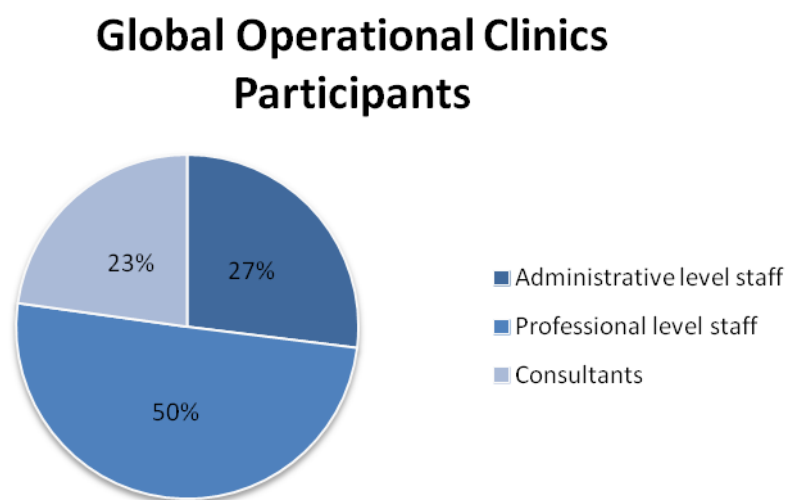


Figure 2. Global operational clinics participants by role

Shifting learning delivery from a regional to global focus also required developing new ways of communicating with staff about upcoming offerings. Rather than each region announcing regional clinics to their specific audience, a global announcement is sent to all operational staff, regardless of location. This means that a busy, mobile workforce can choose to attend training whenever it is convenient and even while travelling. The result is a mix of regional staff in every clinic offering. For example, Washington, DC staff who cannot attend training during the day can join an early morning or night time webinar targeting staff in Asia.

Early evaluation results

Evaluation for the clinic series is conducted in three parts. First, most webinars have an informal poll at the end of the session asking participants about the ease of getting and staying connected, and about the quality of the connection. Secondly, the World Bank's Learning Management System has the capability of asking staff to rank the clinic session using a five star system similar to Amazon shopping. Finally, a random selection of clinics receive a post-training level one evaluation administered electronically covering participant satisfaction with instructors, content, courseware, perceived skills increase and applicability.

In webinar polls show that most staff are now handling the technology well and have little trouble connecting. The average star rating for the new "global" clinics is 4.3 stars out of 5 stars with a 39 percent response rate. And, finally, 25 percent of the new clinics have been selected for formal evaluation with a 35 percent response rate. These results showed participant overall satisfaction at seventy-two percent (ratings of 6 or 7 on a 7-pt scale). Participants were highly satisfied with the quality of instructors (82 percent).

Lower results in the areas of applicability to job (65 percent) and impact on job performance (59 percent) reflect that the audience is not highly targeted. These results give us reason to review such issues as whether to keep the clinic series open to all staff regardless of job description of immediate learning needs (32 percent of respondent attend for professional and career growth). Additionally, 92 percent of participants want more training in the topic offered. Such a result may indicate that the topics warrant longer, more in depth learning than what a 90 minute clinic can offer the learner.

Some unexpected outcomes

In addition to the outcomes of the learning series that were expected by learning professionals, there have been a number of unexpected results, some which are welcome and others that present an ongoing challenge. Some of the positive and unexpected outcomes were an overall increase of 40% of staff attending clinics from 1,033 participants in 2013 to 1,439 in 2014 and a more diverse mix of staff from the country offices. Figure 3 below shows the overall mix of countries attending clinics during the first 6 months of the new program.



Figure 3. Staff accessing clinics by country – blue shading represents countries reached

Even though each region had previously run clinics, many of these were unique to the region and often not shared openly with other regions and units. The new repository has resulted in easier access and therefore an increase in topics available to staff. Staff are also making requests for other topics of interest to them (economic analysis of projects and risk mitigation for example) and this is facilitated by a quick poll at the conclusion of the webinar asking for staff input. A final welcomed outcome was that presenters have embraced virtual deliveries and adjusted facilitation techniques to be more participatory. Some presenters even feel confident enough to join from home.

Maintaining momentum of the entire clinic series is taking more staff time than expected although there is now more of a routine than there was at the outset. The regional learning teams will merge into one unit sometime in the next several months and this will present yet another challenge to reorganize – most likely with fewer staff. One final challenge is to make better use of webinar recordings for topics that have not changed and to develop a process to keep this routinely reviewed.

Conclusion

This collaborative effort has been a rewarding one both for the staff involved and for the staff participating in the learning events. The three part focus of developing new and more coordinated ways to reach out to staff in country offices, standardizing and developing training materials, and building an effective and shared repository, have all contributed to early success in the launch of the program. Ongoing challenges no doubt await and some more immediate efforts are required to make better use of webinar recording for content that has stabilized, review target audiences and evaluation instrument applicability, and to build and maintain the operational series while reorganizing as a group over the next few months.

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TEACHERS' CPD PROGRAMME IN FOSTERING COMPETENCES – COMMUNITIES OF PRACTICE SUPPORT MECHANISMS

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Abstract

The key competence acquisition by every young person is one of the long term objectives of the updated strategic framework for European cooperation. Most of the EU Member States are formulating and at least beginning to implement policies that move their school systems from being predominantly input led and subject-oriented towards curricula which include competences, cross-curricular activities, active and individual learning, as well as a focus on learning outcomes. The enhancement of transversal key competences of students can take place through building teachers capacity for competence oriented education. This paper presents the outcomes from the needs analysis survey on key competence acquisition in Greece, as well as the design and localisation of the Training Framework and environment based on the collected responses and the specifications set from the Greek Curriculum, the community support mechanisms that have been developed, as well as the impact of these mechanisms based on indicators and survey results from users.

Introduction

Key competence acquisition (KCA) is one of the long term objectives of the updated strategic framework for European cooperation (Official Journal of the European Union, 2009). The concept of key competence originated with the adoption of the Lisbon Strategy in 2000 and it resulted in the European Reference Framework (European Commission, 2006). Key competences in the EU framework are those that 'all individuals need for personal fulfilment and development, active citizenship, social inclusion and employment'. The Framework identifies and defines eight (8) key competences among which the five (5) are considered transversal. Most of the EU Member States are beginning to implement policies that move their school systems from being predominantly subject-oriented towards curricula which include competences, active and individual learning, as well as a focus on learning outcomes. One such example is Greece, where in the school year 2011-2012, pilot curricula for competence driven education have been introduced. In Austria however, the promotion of holistic teaching methods has been supported at policy level for several years. In other countries (e.g. France, Netherlands) innovative policies are already embedded in national strategy documents and in some cases these have already led to major structural changes, such as the introduction of new qualifications frameworks or the reform of the curriculum around

the Key Competences (European Commission, 2009a). In general, there are a variety of different models of competences in European countries (European Commission/EACEA/Eurydice, 2012). Yet, these developments do not necessarily result in significant, widespread changes in practice – that is, in how schools actually organise and provide learning experiences for pupils. The difficulty is in all cases translating these policies into practice. In this paper we present the current state of Competence-Based Learning (CBL) policy and practice in Greece, the results from the needs analysis study, the design and localisation of the Training Framework and Environment based on the collected responses and the specifications set from the Greek Curriculum, the user/community support services that have been developed, as well as indicators from the user exploitation of these services and feedback collected by users with the use of online questionnaires and interviews.

Background

According with TALIS Report 2013 (OECD, 2014) the types of professional development activities undertaken in the 12 months prior to the survey in descending order are: courses/workshops with a percentage of 71%, the second highest rate is education conferences (44%) and the third highest rate surprisingly enough is through participation in a network of teachers formed specifically for the professional development of teachers with a percentage of 37%. These data demonstrate the potential of innovative professional development methods (e.g. participation to teachers' networks) that safeguard the sustainability of the introduction of innovative approaches to school and need to be considered in the design of CPD Programmes for teachers. The term "community of practice" is of relatively recent coinage, even though the phenomenon it refers to is age-old. The concept has turned out to provide a useful perspective on knowing and learning. A growing number of people and organizations in various sectors are now focusing on communities of practice as a key to improving their performance. "Community of Practice" (CoP) is a social networking term developed by Wenger to describe groups that form among peers for sharing knowledge and information about their professional interests and activities (Wenger, 1998). The first applications of communities of practice have been in teacher training and in providing isolated administrators with access to colleagues. Whilst there is a wealth of literature in exploring the conceptual and theoretical issues related to CoPs, empirical studies have only just started to emerge that show how CoPs can work and be sustained in the educational community (Kirschner & Lai, 2007). Below follows a short description of two current initiatives active in the field of teachers' professional development under which the specific research has been undertaken.

Current initiatives

In line with the EU objectives the improvement and quality of teacher education can have a positive impact on the development of students' competences (Official Journal of the European Union, 2007). In order to achieve this, a pilot teachers training methodology has been developed on the didactics and e-assessment of key transversal competences following a holistic view of students learning, going beyond subject boundaries and finding application in a wide spectrum of curriculum subjects. The TRANSIt approach contributes to the

development of creativity, intercultural and multilingual competences, social development, and “learning to learn” competences. TRANSIt aims to contribute towards the improvement of the quality of competence education by improving teachers’ awareness and professional skills regarding the didactics and e-assessment of the key competences with the use of ePortfolios, and supporting them to bring European and national policies into practice. The overall approach is based on the methodological principles of participatory design with the user groups in the development of the training framework. To this end, stakeholders’ needs analysis was performed in order to identify the obstacles in the process of introducing innovative approaches in teaching practice and to identify enablers that will effectively support such interventions. With an aim to foster innovation in the classroom Open Discovery Space (ODS) project tries to engage teachers, parents, content designers, policy makers in numerous meaningful online communities of peers who create, share, discuss and rate resources, ideas and experiences. Furthermore, a crucial development would be to bring the ODS Communities of Practice to the next level: to the formation of the Virtual Schools on different thematic areas and strong networks of practitioners and teachers-as-content-designers, working in similar fields. Below we will present the synergies between the two initiatives towards the delivery and creation of a community around CBL.

Current state of Competence-Based Learning in Greece

CBL activities are defined in the present study as educational activities aimed to students’ KCA. The method by which competences have been introduced in the education system varies among countries. Some have introduced these approaches through adaptations of the curriculum, whilst others have done it through legislative change (Gordon et al. 2009). LimeSurvey was used for the online Greek questionnaire aimed at identifying the profiles of the possible participants in TRANSIt training activities, the current implementation of CBL, as well as participants training needs. In the survey 648 responses were collected. The survey is analytically presented in Riviou and Sotiriou (2013).

TRANSIt Framework

The *TRANSIt Teacher Competency Framework* defines the criteria from which it will be possible for a teacher to determine how competent they are in didactics and e-assessment of transversal key competences (using rubrics). A competence framework is a model that broadly defines the blueprint for ‘excellent’ performance within an organisation or sector. The frameworks that influenced its design were the UNESCO ICT Competency Framework for Teachers (United Nations, 2011) and the Western Australia Teacher Competency Framework (Western Australia Department of Education, 2009). Based on the needs analysis survey the Training Framework¹ has been designed in a modular format, so that it could be localised. Teachers taking the course or course modules will be handled as learners participating in authentic learning activities; also creating and using e-Portfolios as part of their learning process. In order for assessment to be authentic, the proposed approach is the use of ePortfolio combined with rubrics, in two levels, in teachers’ training/competence

¹ <http://transit.cti.gr/moodle/>

development, as well as for the classroom practice (e.g. as students' projects in Upper Secondary School according with National Curriculum). The approach towards supporting teachers in designing learning scenarios is to provide exemplar templates or descriptions which can be shared, re-used and adapted to different contexts. Below follows the description of the didactic approaches, as well as the main templates suggested to be used by members of the online community in order to share their resources.

Didactic approaches promoting competence based learning

According with the literature among the didactic approaches that promote competence acquisition is: project based learning, the storyline approach, guided discovery, action learning, Problem based learning, Co-operative learning and Inquiry learning. A review by the EPPI-Centre at the Institute of Education, University of London (2005), found that and collaborative professional development was linked with a positive impact upon teachers' repertoire of teaching and learning strategies, their ability to match these to their students' needs, their self-esteem and confidence, and their commitment to continuing learning and development. They also found evidence that such professional development was linked with a positive impact upon student learning processes, motivation and outcomes. On the other hand, recent studies highlight the value – in terms of professional development – of engaging teachers as learning designers (Sagi & Kali, 2014; Voogt et al., 2012). To this end, in order to support the design and sharing of user generated scenarios, suggested *templates* describing pedagogical approaches promoting KCA, as well as specific cross-curricular competence based scenarios and lesson plans have been developed as demonstrators and a source of inspiration for teachers.

Supporting the professional development community on the thematic area of CBL

The key to effective professional development is finding a way to organise qualified teachers, so they can collaborate with their colleagues. Collaboration and exchange of practices needs to be encouraged through training. The specific Parent Community is a Professional Development and Innovation Seeking one. Multilingual sub-communities have been created for users support (EL, NL, ES, FR). Moreover, with an aim to support the engagement of teachers as learning designers a series of online, as well as offline events have been delivered along with support via resources provision. A short description follows as well as the dates of events delivery, since these events have a great impact on the community. The dates that these newsletters have been circulated are: 17/6/2014, 6/8/2014, 4/9/2014 & 19/11/2014. On the latter date an invitation from the Institute of Pedagogy has been circulated to schools to participate in the ODS implementation activities.

Resourcing the community: Development of online resources

Templates developed describing the CBL approaches have been populated with resources leading to the production of learning scenarios and lesson plans; such example of learning scenario is the “3D printing of a minoic vase”². These scenarios have been available online in the community as demonstrators and best practices for the training events, and with an aim to motivate users to contribute their own scenarios, resources and experiences.

Events as community support mechanisms (face to face & online ones)

In the case of Greece at the time of writing the following programme has been designed and delivered: provision of the online pilot course, as well as face to face training workshops that took place in Athens, Patras and Crete in 24/06/2014, 01 & 03/07/2014 and 19/09/2014. Participants in every case were given instructions on the TRANSIt Greek Community³ in order to register for the events. Registrations from interested users to participate has been huge (fifteen fold the number of participants that could be facilitated), but since only a limited number of participants could be facilitated in the workshops due to space restrictions, after their implementation all presentations and activities have been uploaded on the community so that all members could have access to these materials. A series of webinars has been delivered in Greek. More specifically: “Evaluation and ICT integration in project based learning”⁴, held on 23.6.2014; “I will facilitate a project this year, what do I need to know about it?”⁵, held on 15.9.2014; “Authentic evaluation: Use of ePortfolio tools in projects”⁶, held on 23.10.2014. Guidelines for the conduction of the webinars have been announced on the Greek Community on ODS Portal. The recording of the Webinars were available after the conduction as videos on YouTube and the links have been announced on the Community. The webinar recordings have in some cases around 1,600 views demonstrating the value of sharing events in the context of an online community.

Indicators

In the following section indicators about the TRANSIt Greek Community currently having 724 members (February 2015) are presented with use of the ODS Analytics tool. The progress in registrations of new members took place highly connected with the top-down professional development activities and events.

² [http://portal.opendiscoveryspace.eu/el/scenarios-view/FWq\\$2F\\$2F\\$g3aA1Ep5NAYqEPufw\\$3D\\$3D\\$](http://portal.opendiscoveryspace.eu/el/scenarios-view/FWq$2F$2F$g3aA1Ep5NAYqEPufw$3D$3D$)

³ <http://portal.opendiscoveryspace.eu/community/katartisi-ekpaideytikon-stin-ekpaideysi-gia-anaptyxi-ikanotiton-184334>

⁴ <https://www.youtube.com/watch?v=cqzesbcq4f8>

⁵ https://www.youtube.com/watch?v=LGD_AtBXnxM

⁶ <https://www.youtube.com/watch?v=UhfJAYOx7Xc>

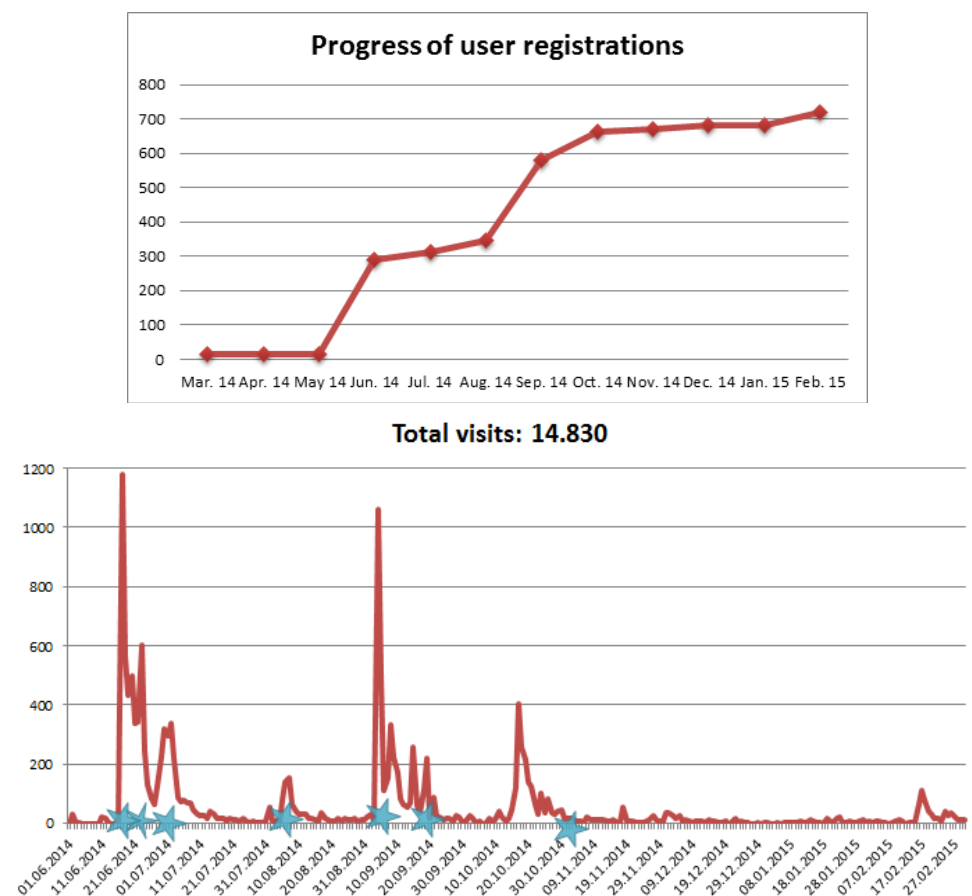


Figure 1. Progress in registration of new users in TRANSIt Community (left) – Total visits of TRANSIt Community (right)

The Greek community on the theme of CBL is a public one, allowing access to its resources to all ODS members. There are about 15,000 page views over the period June 2014 – February 2015. As it is clearly evident there is a considerable increase in interest in the Community, as the number of page visits demonstrates, especially on the dates that community support events took place such as circulation of the aforementioned newsletters and workshops (marked with stars).

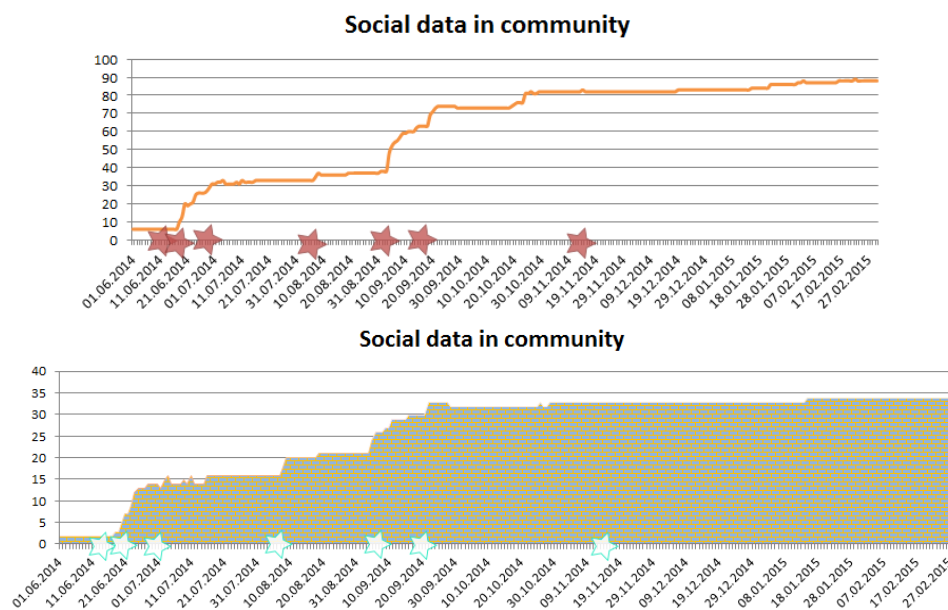


Figure 2. a. Social data in Greek TRANSIt Community (left) – b. Social data on the resources of the Community (e.g. tags, bookmarks, comments) (right)

Figure 2 presents the use of Social Data (Comments, Bookmarks, Followed Users, Followed, Shares & Followers) in the community, as well as the social tagging of the educational resources. Again it is evident that there is a considerable online activity around the dates that the aforementioned events took place.

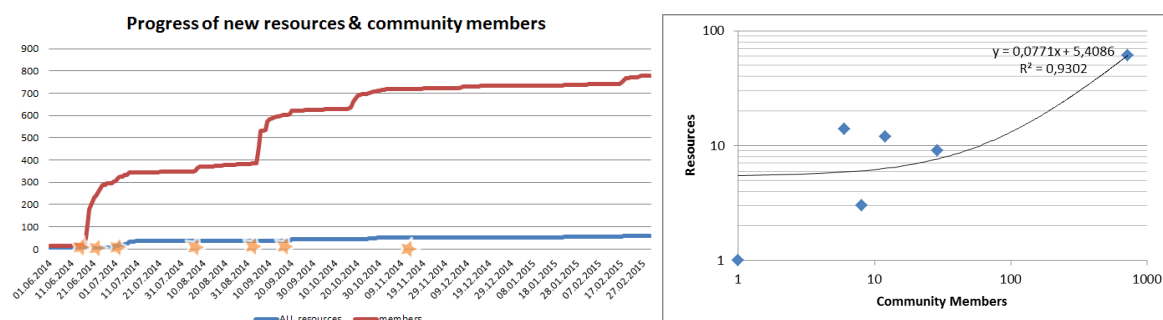


Figure 3. a. Progress in new resources and community members (left) – b. Percentage of users that contribute resources on Portal (right)

In Figure 3 the TRANSIt Community members' progress vs. new resources progression is depicted. These findings are aligned with White (2012) that most of website users (as high as 80%) who log onto a site are "lurkers" – they will take an occasional look at a website but will not participate in it; the participants, also called "posters" or "contributors" are in the minority. As depicted in Figure 3.b almost one in ten users create and contribute resources on the portal. One of the challenges is therefore fostering such a culture to participants in sharing their educational resources and deploying the proper tools in order to engage them. In Figure 4 the TRANSIt Community members' contributions on ODS portal is presented; thus their engagement. As we can notice there is considerable difference between contributions in general (activity in the communities) vs. the creation of new resources. Participants are quite hesitant in sharing their educational resources; therefore such culture needs to be promoted.

From the number of users, 90% are considered as “old” users, more than 3 months and contributors are all old users (not new-comers in the portal). Moreover, most of the contributors feel that are competent having self-assessed their competences on Level 3; they feel confident about their competences based on the UNESCO ICT Competence framework (Figure 4.b).

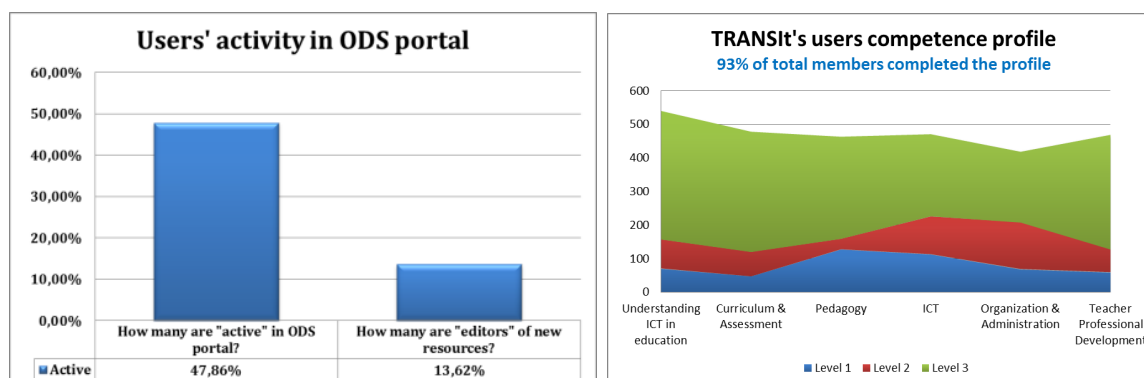


Figure 4. a. Contributions per registered user (left) – b. Members' competence profile (6 themes, 3 levels)

Evaluation Results from users

Organisational aspects such as the venue, the programme and the materials of the training activities/events, as well as the actual training content have been assessed by community members. The main areas covered were awareness, didactics, and assessment of Transversal Key Competences, as well as the impact of the pilot training activities. The assessment tools used were a user satisfaction questionnaire and an interview guide. The online questionnaire was filled in by 318 participants and 13 interviews have been conducted. Participants graded their satisfaction around the community support events regarding organisational aspects, actual content, tutors feedback (webinar, as well as the face to face workshops) on a five- point Likert scale. The average rating regarding the overall assessment of all events is 4.3 in the scale of 5 that is a rather satisfactory result. Interviews conducted allowed gaining deeper knowledge on specific aspects of CBL, as well as a way to record the impact of the training events.

Conclusion and recommendations

In general, the EU is prioritising the improvement of the quality of teacher education so as to have a direct effect upon levels of students' acquisition of competences. Therefore, the professional development of teachers and their training is a key requirement for the way forward (European Commission, 2010). Our needs analysis confirms that, given the limitations imposed by the official curriculum in Greece, teachers are generally motivated to make a paradigm shift towards CBL. The profile of the participants demonstrates that there is a strong interest especially by secondary education teachers to get trained and exchange practices within peer networks and communities of practice. This is aligned with the literature findings that the situation is even worse for teachers of secondary education since their training has not prepared them for the most part for holistic methods and cross-curricular

teaching, although primary teachers may have more expertise in CBL approaches (European Commission, 2009a). The preference of teachers and head teachers to learn primarily from demonstration of tools and instruments, practical assignments and examples of good practices, demonstrates the need of stakeholders to undertake hands-on training, and that teachers need support in their everyday practice. TRANSIt training framework and environment designed has been presented. TRANSIt training content includes specific examples/good practices and tries to address the training needs with an emphasis on assessment methods and tools, also by taking into consideration European reports (Redecker, 2013), as well as the national context requirements set by the Greek Curriculum. The key to effective professional development is finding a way to organise qualified teachers, so they can collaborate with colleagues. Collaboration and exchange of practices needs to be encouraged through training, let alone since participants refer to the benefits of collaboration with colleagues. Events such as contests and webinars and wide dissemination of such activities have proven to be a valuable tool for the support and population of these communities. Time is needed so that a new user proceeds from the basis of consuming content to the process of contributing. The feedback we got though from the interviews conducted so far is that teachers would be eager to contribute their resources on the portal. As shown by contributions per user, participants are quite hesitant; therefore such a culture needs to be fostered. Further work remains further support and monitoring of the community under study in order to increase its users' engagement and the creation of long-lasting Virtual Schools on the theme of competence development. The possible ineffectiveness of top-down approaches in providing support and training for teachers makes the support and role of online communities such the ones presented in the current study even more crucial.

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INCLUSION'S FINAL FRONTIER: UNIVERSAL DESIGN FOR LEARNING – ICT AND INNOVATION IN TRANSFORMATIVE EDUCATION

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Overview: differential access and learning

The last two decades have produced ample evidence of the extent and degree to which ICT permeates social structures, economy and the generation and transmission of knowledge itself. While much research has concentrated on the ways in which ICT has initiated, facilitated or accelerated key processes of social change, it is also true to say that social change is shaping our understanding of the social role and potential of ICT. To put it simply, ICT based knowledge generation and transmission systems may play a powerful role in an emerging emancipatory dialectic. Or, on the other hand, they may serve increasingly to restrict human choice and freedom, monitor 'unacceptable' behaviours or beliefs and gradually target the intimacy and freedom of human thought and opinion forming. All this poses a fundamental challenge to our understanding of ethics, critical dissent, objective inquiry and the possibility to assert the primacy of human rights and choice in shaping a viable social system within an economic framework many commentators now regard as increasingly restrictive and inequalitarian.

Historically, the linearity and recurrence of the written word underpinned the emergence of educational bodies, schools, instructional techniques, scientific method and the very organization of official, legally registered and sanctioned schools and academies (Graff, 1979; Goody, 1990). Knowledge itself became a message – to be repeated and conveyed to far greater numbers of people. The process of conveying knowledge and information depended increasingly on more books being printed – with the assumption recipients were able to read. People with access to standard writing systems had the possibility not only to use but also produce knowledge. They also had competitive advantage. However, admission to knowledge production levels was restricted. Different normative and institutional strategies were organized to select those perceived as capable of producing innovative breakthroughs, validated by accepted scientific communities. This entailed hierarchic, controlled and mediated knowledge ownership and transmission systems.

Formal education systems transmitted and propagated accepted scientific doctrine – knowledge produced by means of curricula that selected ideas and skills that learners required for subsequent application to their professions. As a result, education placed emphasis on

teaching and instruction. The teacher played a major part in this framework, given that these were the people who taught those that did not know. This 'banking conception' of education was one in which the student was an empty container that had to be filled with content, opposed to a candle to be lit (Freire, 1973). On the whole, traditional learning systems in the Western World were modelled around the idea of differential access to learning and knowledge, reflecting surrounding existing differences in stratified social systems. Classrooms were structured in strictly didactic ways in terms of pedagogy. In addition, classrooms were located in fixed places – the architecture itself reflecting notions of hierarchy, order and control (Bruce, 2009)

Shaping Inclusive Discourse

Traditional economic systems and market driven learning policies have undergone a fundamental challenge in terms of relevance and ability to meet the needs of individuals and communities alike. The crisis since 2008 has placed a new focus on the innovation imperative – not just to solve problems but also to ensure that understanding exists on why the crisis occurred and what is necessary to stop it happening again.

All European countries have seen the impact of this change or are in the middle of addressing the policy, social and economic issues that arise from it. These changes produce many benefits but also have created a number of challenges and difficulties. The nature and scale of this has a direct impact on learning for those working in inclusive education or specialized sectors, in particular regarding disability. In addition to new challenges in equality related employment issues, old issues have re-asserted themselves:

- Ethnic demographics;
- Discrimination regarding disability;
- National frameworks and Socio-cultural structures;
- Flexibility and adaptability;
- Educational systems and the ownership of learning.

One of the central questions informing the emerging dimensions of innovative learning in international contexts is how to work with the needs of specific communities to create a new matrix of opportunities for inclusion, mutual benefit and intercultural encounter. This has specific implications for learning specialists and educators in terms of professional training, best practice and standards in approaching community diversity.

The centrality of the concept of lifelong learning to new EU initiatives requires attention. This reflected the Commission's concerns that Europe should display a constant emphasis on best practice if it is to keep up with the needs of all its citizens. The nature of lifelong learning is responsiveness to the needs of the learner. This has particular relevance for those with disabilities. The issues posed by the experience of disability (and the consequent marginalization and discrimination in most European societies) have a strong organic link to the themes and topics addressed by lifelong learning.

Inclusion is not necessarily a neutral concept, although it is universally valued in academic literature and policy statements. Social inclusion and educational provision can provide a dynamic synergy of perspectives and possibilities. But the challenges should not be underestimated. Inclusion cannot be tacked on as a well-meaning cosmetic aspect to otherwise stratified course provision. Inclusion needs to move beyond token gestures on social responsibility to being the foundation of all course provision where inclusive thinking, methodology and principles inform all aspects of learning design, access and deployment.

Part of this inclusionary dynamic is to find newer and more innovative ways to include those normally excluded from educational provision. Another is to ensure that all courses reflect an understanding of the inequalities and disparities present in our society from the outset. Closely connected to this should be an ever-deepening awareness of the nature and extent of diversity in society.

The experience of disability

The removal of barriers to participation and the enhancement of embedded equality approaches are about asserting strategic policy vision. Since the *Salamanca Statement* of 1994 and the *UN Convention on the Rights of Persons with Disabilities* (2008), there is a political aim within EU countries that all people with disabilities have the same right to inclusion as everyone else. Although there are many efforts to reach this goal, there is still a long way ahead before reaching a society where equal opportunities are guaranteed for all.

There is no unified definition of inclusive participation. The common factor to all definitions of inclusion is that they stem from the principle of human rights (UNESCO, 2001; UNESCO, 2003) and are therefore defined more broadly as they relate to social inclusion and do not merely include the educational dimension of inclusion.

The European Union's involvement in disability issues had originally been primarily as a resource for the European Social Fund activities in relation to vocational training. In the 1980s, however, it began to promote a wider consideration of social measures and instruments to secure the rights, responsibilities and inclusion of disabled citizens. While recognizing the widely different approaches, understandings, mechanisms and policies of Member States in relation to disability, the EU began to promote some common initiatives. First among these was the Helios Programme, which ran until 1996. This influenced the EU Council of Ministers to adopt a report, *A New European Community Disability Strategy*, which endorsed and expanded the United Nations' Standard Rules. Specifically, this report re-asserted the principles of employment and non-discrimination as key elements in developing social inclusion for people with disabilities over the longer term.

The European perspective stressed linkage of inclusion for people with disabilities with enhanced equality of opportunity. In its Resolution on the *Equality of Opportunity for People with Disabilities* published in 1997, the European Commission, while recognizing that the primary responsibility for action lay with individual Member States, nonetheless laid out a set

of key guiding principles. The principles on education asserted the need to overcome segregated systems where restricted access to mainstream resources affected quality education for all.

Universal Design for Learning – origins and impact

The roots of UDL (*Universal Design for Learning*) are in the early civil rights and special education legislation that emphasized the right of all students to a free, appropriate public education in the least restrictive environment. The UDL framework was conceived by researchers in the United States who subsequently established the *Center for Applied Special Technologies* (CAST) in the late 1980s as the result of three conceptual shifts:

- Advancements in architectural design
- Developments in education technology
- Discoveries from brain research and neuropsychology.

Influenced by architectural Universal Design principles, the accessibility and flexibility offered by digitized text, and the conceptualization of three learning networks, CAST innovators developed “*Universal Design for Learning*”. CAST defines *Universal Design for Learning* as “a set of principles for curriculum development that gives all individuals equal opportunities to learn”. The existence of ever more advanced technologies and the definition of the needs and requirements of a specialized group (those with disabilities) created a powerful synergy of creativity and innovation that began to question traditional curriculum design itself as being potentially discriminatory.

UDL provides a blueprint for creating instructional goals, methods, materials, and assessments that work for everyone – not a single, one-size-fits-all solution but rather flexible approaches that can be customized and adjusted for individual needs. UDL embraces the concept of improved access for everyone and applies it to curriculum materials and teaching methods. Rather than rely on Assistive Technologies (AT) to bridge gaps between materials and student learning needs, materials designed using UDL concepts have built-in accommodations. Add-on technology is less often needed to translate the material into a mode that enables learning. One central idea of UDL is that as new materials and technologies are developed, they should be designed *from the beginning* to be flexible enough to accommodate the unique learning styles of a wide range of individuals, including those with disabilities. Some examples of UDL include: accessible web pages; captioned and/or narrated videos; word processors with word prediction; speaking spell checkers; talking dialogue boxes; voice recognition; picture menus.

UDL does not eliminate the need for assistive technology. Learners with disabilities will continue to need AT devices (e.g. communication aids, visual aids, wheelchairs, orthoses and adapted toys) in order to interact more fully with their environment. However, building accessibility into new technologies and curricular materials *as they are developed* helps to

ensure maximum inclusion of learners with disabilities into the full array of learning opportunities that are available to all.

Traditional economic systems and market-driven learning policies have undergone a fundamental challenge in terms of ability to meet needs of individuals and communities. The crisis since September 2008 has placed a new focus on the innovation imperative, thus raising the agenda of how innovation and creativity can meet human and social needs effectively. UDL uses advanced ICT to create an educational environment that allows all students, including those with learning disabilities, to succeed in general education with minimal use of assistive technology.

UDL extended to all learners

The concept of diversity suggests that each individual is unique, while recognizing individual differences. Diversity management is a set of conscious practices and skills around understanding and appreciating interdependence of people, cultures, and the natural environment, practicing mutual respect for qualities and experiences, and understanding that diversity includes not only ways of being but also ways of knowing. In UDL diversity has its origins in the field of disability and rehabilitation for a wide range of disabilities – sensory (visual and auditory), physical, neurological, developmental/intellectual and psychiatric. But the diversity also includes those other dimensions around gender, ethnic origin, religious belief, migrant status, sexual orientation and a host of other situations.

At the Center for Universal Design in the University of North Carolina, a group of architects, product designers, engineers and environmental design researchers established seven principles of UD to provide guidance in the design of products and environments. The CUD principles of UD are:

1. *Equitable use.* The design is useful and marketable to people with diverse abilities. For example, websites designed to be accessible to everyone, including people who are blind and use screen reader technology.
2. *Flexibility in Use.* The design accommodates a wide range of individual preferences and abilities.
3. *Simple and intuitive.* Use of the design is easy to understand, regardless of the user's experience, knowledge, language skills, or current concentration level.
4. *Perceptible information.* The design communicates necessary information effectively to the user, regardless of ambient conditions or the user's sensory abilities.
5. *Tolerance for error.* The design minimizes hazards and the adverse consequences of accidental or unintended actions.
6. *Low physical effort.* The design can be used efficiently, comfortably, and with a minimum of fatigue.

7. *Size and space for approach and use.* Appropriate size and space is provided for approach, reach, manipulation, and use regardless of the user's body size, posture, or mobility.

The *Center for the Implementing Technology in Education* has highlighted the increasing emphasis on use of technology in education. While many schools have made significant technology purchases, these purchases are driven because of community pressure, because new technology has received positive attention or is perceived as attractive. These types of technology purchases may languish on shelves, never to be used by more than a handful of teachers because they were not made with the curriculum in mind. CITED instituted a set of *Technology Innovation Partnerships* (TIP) in the United States in 2006. TIP schools increased teachers' use of technology tools by making sure the tools and training were relevant and directly linked to the curriculum and that teachers had time to practice the technology. In this way, teachers increasingly integrated technology into other learning activities. The Universal Design concept has roots in three areas:

1. Design of physical environments (residential and commercial space);
2. Web development;
3. Teaching and learning (Universal Design for Learning).

UDL aims to create barrier-free environments that enable today's teachers to apply universal design concepts in ways that support the needs of the widest range of learner differences. With the learning needs of today's student populations becoming increasingly diverse, an enhanced understanding and application of UDL is essential. UDL is a field of inquiry and practice that considers ways of developing course content in a manner that is proactively accessible to as wide of an audience as possible.

A critical aspect of UDL is that the initial effort and expense of designing for a non-standard or non-traditional population ends up benefitting wider populations in sometimes-unexpected ways. Ease of access for one group has intended and unintended benefits for all. This is UDL at its best. Universal Design for Learning (UDL) proactively designs course content in a manner intended to be as accessible to as wide an audience as possible. The instructor pre-emptively addresses course content, structure and delivery that targets defined (or undefined) accessibility issues. In this way benefits of improved accessibility are available to the entire class cohort rather than just those seeking the specific accommodation.

UDL has as its basis the idea that designing in a way that is more accessible to a target group is also likely increasing the accessibility for others. One of the challenges for UDL is that innovations introduced to improve accessibility for one group may actually impede accessibility for another group. As a transdisciplinary approach that synthesizes insights from various academic fields (developmental psychology, neuropsychology, neuroscience, sociology, education theory and practice), UDL is well positioned to serve as a catalyst to spark deeper connections between research, practice, and policy. CAST itself has been pursuing several areas in research on UDL applications. These include Supports and Scaffolds

in UDL; Learning Analytics and Progress Monitoring; Authoring Platforms; UDL in Literacy, Science and Math; Smart Images; Online Learning; Implementation of UDL to Improve Teacher Effectiveness.

Understanding the potential of UDL is seductively easy. Its exponential growth indicates that it may be the right idea at the right time. However, it has proven far easier to help the various stakeholders understand the potential of UDL than to implement UDL on a large scale.

In Europe the UDL Network (*UDLnet*) project commenced in 2014. *UDLnet* aims to collect and create best practices under the framework of UDL from a wide range (generic guidelines down to more specific ones) of four envisaged themes: inclusive learning environments, accessible resources, teachers' and school leaders' competences, examination of barriers and identification of opportunities. Moreover, it is investigating current needs related to the use of mobile devices in UDL practice, along with the application of the UDL framework in real inclusive educational practices. *UDLnet* targets 3,500 users in seven countries across Europe (Greece, Ireland, Cyprus, Finland, Netherlands, Germany, Spain) and in six languages.

In general, *UDLnet* aims to improve teachers' practice in all areas of their work, combining ICT skills with UDL-based innovations in pedagogy, curriculum, and institutional organization. It is also aimed at in-service and pre-service teachers' use of ICT skills and resources to improve their teaching, to collaborate with colleagues, and perhaps ultimately to become innovation leaders in their institutions.

This shift in emphasis – from access to learning environments to learning itself – is a key tenet of UDL. In a sense, it is the bridge between special education and general education: a concern that all learners get a high-quality education. One of the challenges faced in education is to reach students who have not traditionally done well in the education system, including students with disabilities, migrants, language learners, and children from lower deprived socioeconomic backgrounds. Currently, most learning environments and curricula are too restrictive to support effective and efficient learning for all students. UDL creates a framework to reduce the barriers in education, anticipate the diversity in everyday mainstream classrooms, and embed support into national curricula. The implementation of a UDL framework has the potential to open doors in education to all students, especially those not effectively served by current systems and structures. This embeds inclusion as both a method and valued outcome, a critical resource in times of significant structural transformation.

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DISTANCE EDUCATION IN EUROPEAN HIGHER EDUCATION INSTITUTIONS – ANALYSING MECHANISMS FOR INCREASING PARTICIPATION OF ADULT LEARNERS

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Abstract

The aim of the paper is to present the research objective, the preliminary results and the potential impact of distance education within the framework of the IDEAL project¹ (“Impact of Distance Education on Adult Learning”²) a project carried out jointly by the International Council for Open and Distance Education (ICDE), the UNESCO Institute for Lifelong Learning (UIL) and StudyPortals (SP). The project examines the interrelations of adult learning, higher education and distance education. It has been designed to explore if and how higher education institutions can contribute to adult learning by means of distance education. It seeks to offer insights on the needs of adult learners to both policy makers and distance education providers and to increase the participation of adult learners in higher education through distance education.

Distance education is considered as a generic concept covering different organisational forms of education like online education ($\geq 80\%$ of the content delivered online) or blended education (30-79% of the content offered online). In recent years the boundaries between distance education and campus-based education have become increasingly blurred, resulting in a mixed form of education often referred to as flexible education. The research project therefore draws upon this concept and seeks to analyse the degree of flexibility (in time, place, tempo and way of studying) of the distance education offered by different higher education institutions. In the study only formal education has been considered.

In the context of this research project, three studies have been carried out: Study 1 examined the distance education offer of European higher education institutions – what is offered and for whom is it designed? Study 2 consisted of a survey among enrolled distance education students in Europe and outside Europe to analyse their social profile, their motivations, the barriers they encountered, etc. Study 3 focused on potential distance education students – who are they, what do they look for, what are the barriers?

¹ <http://www.idealproject.eu>

² IDEAL Project number: 539668-LLP-1-2013-1-NO-ERASMUS-ESIN (20133864)

Whereas current data on the participation of adults in education is usually obtained through grand-scale household surveys such as the Labour Force Survey or the Adult Education Survey³, this study analyses the actual content of the distance education offer, the experiences of students enrolled in distance education as well as the potential of distance education for adult learning. The results and conclusions published in the final report will be of relevance to researchers in the field of policy studies in adult education, policy-makers and higher education institutions alike.

Introduction

The IDEAL project (“Impact of Distance Education on Adult Learning”) is a joint project of the International Council for Open and Distance Education (ICDE), the UNESCO Institute for Lifelong Learning (UIL), and StudyPortals (SP). It runs from October 2013 to September 2015 with financial support from the EU Lifelong Learning Programme (sub-programme Erasmus Multilateral Projects).

Purpose of the project and research questions

The IDEAL project has been designed to get a better understanding of distance education offered by higher education institutions and to examine how higher education institutions can contribute to adult learning by way of distance education; specifically: **“How can the distance education offer of European higher education institutions be better matched to the needs of adult learners?”**

The project aims to:

- offer insights on the needs of adult learners to both policy makers and distance education providers;
- strengthen the social dimension of higher education by better meeting the needs of adult learners;
- increase the participation of adult learners in higher education through distance education.

This research question has emerged essentially from the continuing emphasis of lifelong learning as a policy objective both at European Union level (foremost the Europe 2020 Strategy⁴) and in the context of the Bologna Process. For the latter, lifelong learning has been recognised as an essential element of the European Higher Education Area since the Prague Communiqué of 2001. It signalled that “in a Europe built on a knowledge-based society and economy, lifelong learning strategies are necessary to face the challenges of competitiveness and the use of new technologies, and to improve social cohesion, equal opportunities and quality of life”. Since then, there has been growing awareness of the need to embed lifelong learning within higher education. The 2009 Leuven/Louvain-la-Neuve Communiqué strongly emphasised this need and the 2012 Bucharest Communiqué reaffirmed “the role of lifelong

³ <http://www.ilo.org/dyn/lfsurvey/lfsurvey.home>

⁴ European Union, Europe 2020: http://ec.europa.eu/europe2020/index_en.htm

learning as one of the important factors in meeting the needs of a changing labour market”. It has been stressed since that access to higher education for adult learners needs to be ensured.

In 2011, the Council resolution on a renewed European agenda for adult learning underlined the need to encourage higher education institutions to embrace adult learners. It is against this backdrop that the IDEAL project has set out to examine how the participation and attainment rates of adults can be increased, not only from the perspective of the providers (higher education institutions), but also from a student perspective. The focus on the distance learning offer as provided by higher education institutions has been chosen deliberately as many studies, among the HEAD study⁵, identified flexible learning arrangements as decisive factor facilitating adult participation in higher education. This approach was made possible through the successful implementation of a European database on distance learning courses provided by higher education institutions, the DistanceLearningPortal collecting data since 2012.

Outline of this paper

This paper will first define the key concepts, namely adult learners, distance education, higher education institutions, as used in the IDEAL project. By way of doing so, the scope of the project will be clearly delineated (2. Core concepts used). Secondly, the project research methodology will be outlined (3. Background and research methodology), including a short introduction of the main surveys carried out at European level and presenting insights for increasing participation in higher education (4. Preliminary results of study 1-3) and some 5. Preliminary conclusions and recommendations.

Core concepts used

The UNESCO Institute for Statistics defines adult education as “Education specifically targeted at individuals who are regarded as adults by their society to improve their technical or professional qualifications, further develop their abilities, enrich their knowledge with the purpose to complete a level of formal education, or to acquire, refresh or update their knowledge, skills and competencies in a particular field. This also includes what may be referred to as ‘continuing education’, ‘recurrent education’ or ‘second chance education’.” (UNESCO, 2012).

In the case of adult learners, this definition makes it difficult, though, to distinguish between those still in the process of completing initial education and those returning to education at a later stage. As the IDEAL project focuses on the latter, it will use the definition provided by the European Centre for the Development of Vocational Training (Cedefop, 2008) in its “Terminology of European education and training policy”, which restricts *adult learning* to **learning undertaken by adults after they have left their initial education and training**. That means that the adult learners targeted by the IDEAL project are adults returning to education

⁵ HEAD Study - Developing the Adult Learning Sector. Final Report: ec.europa.eu/education/library/study/.../adult-learning-g_en.pdf

after a period of work, unemployment, parental leave, etc. While EU studies (e.g. the Adult Education Survey) targets (e.g. the 15% benchmark on adult participation in lifelong learning by 2020) often concentrate on those aged 25-64, the IDEAL project takes a more holistic approach and includes all learners who have completed their initial education and training and are returning to education (or at least considering it), no matter what age they have. The UNESCO Institute of Statistics defines initial education as: “formal education of individuals before their first entrance to the labour market, i.e. when they will normally be in full-time education. It thus targets individuals who are regarded as children, youth and young adults by their society. It typically takes place in educational institutions in a system designed as a continuous educational pathway.” (UNESCO, 2012)

Distance education has a long tradition and has classically been separated from campus-based education. According to UNESCO (2002), “the terms open learning and distance education represent approaches that focus on opening access to education and training provision, freeing learners from the constraints of time and place, and offering flexible learning opportunities to individuals and groups of learners.” (UNESCO, 2002). Such a degree of openness and flexibility will not be offered by many higher education institutions – and most likely only by universities that focus exclusively on distance education (single mode institutions like Fernuniversitaet in Germany and the Open University in UK). The IDEAL project, however, seeks to include also so-called dual mode institutions, offering both campus-based and distance education, that are likely to provide a more limited degree of openness and flexibility, applying a large variety of different interpretations of open and distance education. Distance education within the IDEAL Project is considered as a generic term for different organisational forms of education in which students and teachers are separated in time and space. It includes online education ($\geq 80\%$ of the content delivered online) and blended education (30-79% of the content delivered online) as well as modes of education using printed material delivered by post and/or other tools for bridging the distance and facilitating the learning.

The IDEAL project includes distance education of any length (ranging from individual course units to full degree programmes) that can be enjoyed by any free moving student. There might be entry requirements (e.g. work experience or language skills) but once they are met, any student should be free to follow the courses or programmes (i.e. they are not connected to specific exchange programmes).

Background and research methodology

At EU policy level, the need to embed the principles of lifelong learning in education and broader development policies has also taken on a more urgent tone than ever. The Europe 2020 Strategy has set benchmarks of specific age cohorts who should have completed tertiary or equivalent education (target: 40%, with figures ranging from 18% to 49.6% in 2012). EU Member States have further agreed to raise the benchmark for adult participation in lifelong learning to 15% by 2020. In 2011, the Council resolution on a renewed European agenda for

adult learning underlined the need to encourage higher education institutions to embrace adult learners also by means of distance education.

The goal of **Study 1** was to examine the distance education offer of European higher education institutions and to identify the intended target group(s). For this purpose, an **online survey** was conducted among higher education institutions. With the support of the International Association of Universities (IAU) and its World Higher Education Database (WHED) as well as through the joint networks of the project partners (the International Council for Open and Distance Education (ICDE), the UNESCO Institute for Lifelong Learning (UIL) and StudyPortals) some 4,000 higher education institutions based in the European Higher Education Area have been asked to participate in an online survey in May 2014. The persons addressed were usually the heads of the institutions, i.e. placed at a strategic policy level. All together 167 valid respondents, of which 134 offer distance education. In parallel to the data analysis of this institutional survey, the distance education offer listed on www.DistanceLearningPortal.eu⁶ was analysed. By May 2014, the DistanceLearningPortal covered 3,140 distance education courses and degree programmes (offered online or in a blended way), 1,512 of which in the UK. The large majority of the programmes were master programmes but they also included bachelor and PhD programmes as well as short courses (defined as anything less than three months), such as modules or summer schools.

The goal of **Study 2** was to examine the profile and the needs of actual adult learners enrolled in distance education. To collect the data, higher education institutions that have participated in survey 1 and/or are listed on DistanceLearningPortal were contacted and asked to circulate the invitation to participate in an **online survey** among their enrolled distance education students. 1,773 valid responses were received of which 60% were from the UK, mostly the Open University. The topics to be covered were:

- Personal profile (age, gender, household situation, work and study situation, work experience and previous education, including non-formal education);
- Information on the programme/course selected (field of study, funding situation);
- Motivation to study (in general and for distance education in particular);
- Experiences as a distance education student (work load, barriers encountered and support received, overall assessment).

The goal of **Study 3** was foremost to examine potential students. This study is the most innovative in that it seeks to reach out to potential students. It is also a **multi-component study**, consisting of an **online tracking tool (study choice analytics)** combined with a student **online questionnaire** and **five country case studies**. The online questionnaire yielded 427 valid responses, of which six countries make up almost 50% of the respondents and the study choice analytics retrieved 9 million page views, however biased by the offer available on StudyPortals. To mitigate the technical and other biases on the use of DistanceLearningPortal and to complement the analysis of the data gathered in the three studies, five external experts

⁶ The online report presenting the first results is available here: <http://idealproject.eu/>

have been asked to take a closer look at five countries, analysing existing research on potential distance education students, their profiles, needs etc.

Preliminary results of study 1-3

Preliminary results of Study 1 – Distance education offer of European higher education institutions

- **What is offered:** 50% of the analysed institutions offer mainly face-to-face education but in addition some distance education; 21% distance and face to face education; 9% distance education only and 20% no distance learning.
- **In Europe,** there were to the time of the study 3006 distance education studies available in the portal. 1788 of them were located in the UK.
- **Offer by subject:** 28% of the distance education offer is in Business & Economics; 14% in Engineering and Technology; 14% in Life Sciences & Health; 12% in Social Sciences; 12% in Applied Sciences & Arts; 7% in Law; 6% in Environmental Sciences; 4% in Humanities & Art and 4% in Natural Sciences.
- **Level of education:** 56% of the programmes offered are at a level of a Master, 12% at Bachelor, 6% at PhD and 26% are courses which do not lead to a degree.
- **The intended target groups** for the institutions offering distance education regarding adult learners are adult learners with certain work experience (67%); adult learners with a degree (65%) and adult learners with no previous degree 46%.

Preliminary results of Study 2 – Social profile of adults enrolled in distance education

- **Regarding the current student body in distance education** it can be stated that the majority of distance education students are women. About the age, students of all ages study in distance education, generally older ones than in “traditional” higher education with work experience.
- **About the employment status:** 50% work full time; 19% work part time and 31% are not working.
- **Level of previous education:** 28% hold a high school certificate (or equivalent), 31% a Bachelor’s degree (or equivalent), and 11% a Master’s (or equivalent). 4% hold a PhD degree. The remaining 26% hold ‘other’ levels of degrees.
- **The level of degree to be obtained** reveals that a clear majority of students are studying for a Bachelor’s or equivalent level degree (84 %). 12% and 2% respectively are pursuing Master’s and PhD degrees (and another 2% ‘other’ degrees).
- **The kind of support do adult learners (expect to) get during their studies** are related to the learning material developed/ adapted specifically for distance education (1620); Administrative / organisational support (1627); Moral support; psychological support; counselling (1589) and Opportunities to interact with teachers and other students (1630).

- **The motivations** of students to consider distance education vary widely: they are mostly related to self-fulfilment, employability and status.
- **The main barriers to access** distance education are related to the need for recognition (validation and accreditation) of prior learning; cost of education; time restrictions; language of tuition; technology used.
- It is worth to mention that many of these barriers are the same for distance learning as for conventional learning.

Preliminary results of Study 3 – Potential Students

Student profile

A majority of distance education students are women. Students of all ages study in distance education, but unlike in on-campus education, very young students are in the minority. The majority of distance education students are returning to or entering higher education after a period of work or leave. Very often this includes duties related to family life such as parental leave. A typical distance education student is a person in the midst of life, with family, children and/or work responsibilities. A large majority of distance education students work alongside their studies. Another distinct group of distance education students are retired people, who study for self-fulfilment or in order to stay active. For some students, distance education means a second chance after missing the opportunity to enter higher education earlier in life. Distance education also offers educational opportunities for disabled students or students with other health issues (for example, the Open University UK is the largest provider of higher education for people with disabilities in the UK). Finally, as the term distance education implies, people living in remote areas far away from higher education institutions also constitute an important group of students. **The average potential student** for distance education is between 25-34 years old and in employment. In our dataset the majority of them have completed a bachelor's degree (57%).

Motivation for distance education

Students' motivations to study are highly diverse. Some are motivated by the possibility of career advancement or updating their knowledge; others by the sheer joy of learning. Whilst many students opt for distance education due to time and other constraints in their personal life, it can also be the delivery mode of choice. For example, many distance education students are so-called independent or self-directed students (some of them very young), who prefer distance education because it allows them to study at their own pace thus with little contact with other students. The main reason why students are looking for further education is to improve their career prospects. They intend to go for distance education in order to more easily combine studies with other duties.

Perceived barriers by distance education students

The most common barriers for distance education students are time constraints resulting from work and family responsibilities. As with on-campus education, funding is an important

issue for the majority of students. The use of technology can also constitute a barrier. However our dataset shows:

- **Costs** (46%); Time (26%); Recognition of qualifications/ alternative access routes (19%); Distance education technology (15%); Language of the programme/course (11%)
- (FINLAND report) Shortages in counselling, lack of communication and face-to-face meetings, shortages in the design of the course, problems with the timetable, technical problems, need of self-discipline, and costs of the study
- (GERMANY report) Lack of adult-adjusted programmes, lack of specific support structures for adult students and especially formal regulations
- (GREECE report) Absence of a system of recognition of prior learning and work experience and “More negative image” of distance education degrees
- (HUNGARY report) Costs, lack of the courses people really need in their localities; previous bad learning experience; university distance learning programmes are all fee-paying, and participation in such training is not subsidised
- (UK report) Time pressures to juggle study around other commitments, whether work, family or both.

Study choice analysis

- The analysis showed that most of the potential students are interested in Business & Economics. (36.5%).
- 48.6% of the potential students are interested in courses hosted in the UK (48.6%). Most of the potential students also come from this country (11.5%).
- Regarding what level of education potential distance education students are looking for, the vast majority seems to look for a master degree (69.2%).

Preliminary conclusions and recommendations

The meta-analysis of Study 1 to 3 providing recommendations on increasing participation will be available in the upcoming final report to be issued in May this year. Hence, the full range of policy recommendations of relevance to researchers in the field of policy studies in adult education, policy-makers and higher education institutions will be made available at the EDEN annual conference in June 2015. However, at this stage the analysis shows that higher education institutions offering distance education need to take into consideration that:

- Increasing attainment levels, improving career prospects but also learning for self-fulfilment within the **vision of lifelong learning** are considered the major motivation for adult learners to engage in distance education;
- Provision of online education as the main mode of distance education responds to most adult learners’ request for more flexible learning opportunities;
- Transparency in information on **recognition of prior learning** and possible alternative access modes need to be increased as less than 10% of the universities in the survey provided this information;

- Funding opportunities need to be diversified and eligibility criteria need to be more visible;
- Good study guides are crucial including counselling in the selection process of courses and programmes and varied forms of support during the studies;
- Adult learners request more information on credits and transferability of acquired qualification;
- **Student-to-student interaction** opportunities need to be increased.

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VIDEO-BASED LEARNING IN HIGHER EDUCATION: THE FLIPPED OR THE HANDS-ON CLASSROOM?

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Introduction

Nowadays Higher Education is adopting new ways of teaching such as ways of Video-Based Learning (VBL) with the aim of moving away from the traditional classrooms. Video lectures have been growing in popularity and their use is increasing both inside and outside classrooms (Giannakos, 2013). “Many higher education institutions and educational technology companies are using them as a main of self-study medium or as tool to enhance the learning process” (Vieira, Lopes & Soares, 2014).

Despite VBL has a long history as a learning method in educational classes in the past decade, the interest in VBL has increased as a result of new forms of online education, most prominently in the case of Massive Open Online Courses (MOOCs) (Yousef, Chatti & Schroeder, 2014). VBL has unique features that make it an effective Technology-Enhanced Learning (TEL) approach. Furthermore it seems to support a rich and powerful model to improve learning outcomes as well as learner satisfaction (2014).

Despite this, it is important to note that the mere use of videos in class is not by itself an improvement, since it is necessary to choose an appropriate instructional approach when designing VBL environments (Seidel, Blomberg & Renkl, 2013). One of the latest methods that use video as a tool for learning is Flipped Classrooms – or inverted classrooms – and, in many cases, it is showed that the result of introducing videos in a learning design eventually converges in this type of methodology.

Flipped classrooms

The flipped classroom is an instance of VBL model that enables to save time in the classroom by discussing only difficulties, problems, and practical aspects of the learning course (Tucker, 2012). In the flipped classroom model, learners watch video lectures as homework. The class is then an active learning session where the teacher use case studies, labs, games, simulations, or experiments to discuss the concepts presented in the video lecture (Herreid & Schiller, 2013).

Regarding learning theories, Lowel et al. (2013) suggest that flipped classrooms represent a unique combination of these theories once thought to be incompatible. Firstly, active, problem-based learning activities founded upon a constructivist ideology and then

instructional lectures derived from direct instruction methods founded upon behaviourist principles. Despite of this, Mason et al. (2013) add that an inverted classroom can play a key role in a modern engineering education by freeing time for learner-centred activities and encouraging students to become independent self-learners. The question that our study lays out here is whether a student-based learning system without using inverted classroom would do emerge unexplored students behaviours.

Effectiveness of VBL and teaching methods

The analysis of the VBL research of Yousef, Chatti and Schroeder (2014) showed mixed results in terms of learning outcomes in VBL environments. Despite possible advantages as the high user's rate interaction and learner satisfaction in VBL environments comparing to traditional classroom environments, authors pointed out that several aspects concerning effectiveness in VBL need further investigation:

1. What are the positive and negative attitudes towards using video lectures?
2. How can VBL motivate learners?
3. How can a MOOC as VBL environment personalize the learning experience for learners?

Seems that, a way to improve the effectiveness of the learning experience – with videos or not – is to provide students with a greater degree of freedom to select the educational resources and the learning style that meets their characteristics best. But instead, the previous study showed that most of the reviewed VBL studies followed a teacher-centred approach and only 15% of studies focused on student-centred learning.

According to this, authors denoted that additional research is needed to investigate the benefits of new ways of VBL based on new concepts such as personal learning environments (Greenberg & Zanetis, 2012) and networked learning.

Purpose of Current Study

To explore this context, this research presents a case study that use a combination of the VBL and Project-Based Learning (PBL) methodologies. The classes are face-to-face but there are no lessons: the students develop small projects in labs. A set of teaching explanations are recorded in videos provided together with the descriptions of the projects. The objective of this research is to study the behaviour and satisfaction of the students using the videos, their utility as well as the position of the professors.

Methodology

This research was conducted using a mixed methodology, an option that was considered appropriate because we were faced with complex processes such as behaviour (Creswell, 2005). In the next paragraphs it will be introduced the context of the study as well as the instrumentation, data collection and analysis.

Participants and Sample

Participants were the students of the course “Wireless sensor networks”. This was designed as an optional subject in the 3rd and 4th year of the Bachelor Degrees in Computer Engineering, Electronic Engineering and Audio-visual Systems Engineering within the Engineering School of the Universitat Pompeu Fabra (UPF).

The course is quarterly and with a load of about 100 hours of study per student. It took place in April to June of 2014 and the number of students enrolled for that academic year was 17, of which there were only 3 girls. In class the students worked in groups of 2-3 people, specifically there were four groups of two and three groups of three. Two professors were in charge of the course, one of them acting as a coordinator and other as a teaching assistant.

The sampling technique used was not probabilistic due to the participation in the course was not random. The participants were the units available to the investigator: the students enrolled in the course, so the samples of the study are accidental and therefore biased. Hence, there is no guarantee that they represent the entire population to which they belong. Moreover, the size of the sample, as mentioned before, is 17 people and it will not be enough to draw general conclusions. These two issues must be taken into account in the possible generalization of the results (Yin, 2009). However, the main purpose of the study is to have the maximum guarantees to be able to set affirmations from the field work. The aim of this research is not to maximize external validity – generalization to the population reference –, the intention is to maximize internal validity since it is a case study (Yin, 2009).

Procedure

This subject had been conducted in prior academic years without the aid of videos, but during the year of the study the professors developed a MOOC of the course and they decided to use the videos of the online program as part of the traditional classroom. It was a practical course, divided in 7 projects, where students had to develop seven Arduino circuits. Each project had a video composed by three possible parts (Figure 1): (a) Short explanation of the theory by the professor, (b) Demonstration of how the circuit is built, (c) Instructions of how to program the circuit.

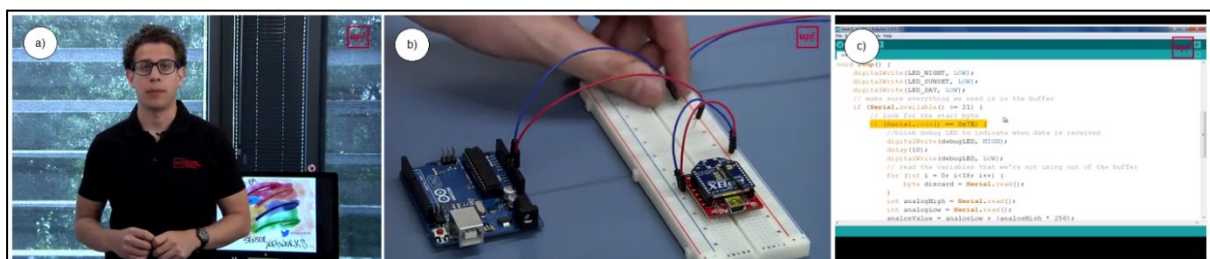


Figure 1. Screenshots from a project's video, where it is showed the three possible types of content explanation:

(a) professor's explanation (b) circuit demonstration and (c) programming instructions.

In addition to videos, students could consult a text guide of the course. That document explained all the information of the videos; in fact, it was the basis for audio-visual material. Both course materials were available in a learning environment: Moodle. Students had free access to the environment and they could connect to it by logging in and outside class times. The students were also allowed to consult external material to the subject.

The instructors did not lecture during the classes and they tried to assume the role of facilitators (Smyth, 2011). During classes, the students worked at their pace developing the circuits done in the video. When they needed help, they could request help from the teacher or consult other classmates. When they had completed the circuit example, they had to develop an improved circuit and propose some innovative applications of it.

Every two weeks the video of a new project was published in the Moodle. Despite this, students could work at their own pace, without strict delivery deadlines. The course did not include a written exam. The participants submitted their work as a post entry in their blog and were awarded a badge for completing the project.

Instrumentation, data collection and analysis

The current study used five instruments to gather data from the field work: two surveys, an interview, an observation protocol and two automatic registers. The first online survey instrument utilized for this research was designed to collect information from students regarding the utility and their interaction with the content in the online learning environment: text material and videos. Students answered this questionnaire once for each completed project.

The second online survey was developed to collect general information from students at the end of the course. The objective was to know their satisfaction with the course, especially with videos, as well as their perspectives about the utility of the face to face classrooms. Last survey question referred to whether the use of videos helped them to become more autonomous. All these survey items used a 5-point Likert-type multiple choice response format.

To gather the professor perspective about the course dynamics, the educator was interviewed in the middle of the course. Moreover, the researcher recorded all classrooms in order to observe the participants' interactions off-line. Basically, two kinds of interactions were observed: students with students and students with professor.

Finally, two automatic registers were used to collect quantitative data. On the one hand, the data from the Moodle Log Files have allowed to obtain all times that students have accessed the course materials through the learning environment – date and time were recorded, in addition to indicate what material was accessed. These results could be downloaded in Excel format to facilitate further analysis. On the other hand, the Youtube Analytics tool has led to the number of visits for each video and information related to the corresponding withholding public.

Note the importance of being able to have more than one view of the object of study, from the integration of the two methods in terms of equality – quantitative and qualitative. This study uses triangulation (Neuman, 2006, p.149) to analyse the data. This is a process that combines strategies, methods or techniques in order to obtain a more accurate – more exhaustive- representation of the phenomenon.

Results

Most of the interaction with content (videos) occurs within class

Figure 2 presents the number of student's Moodle actions per hour depending on the project. Two time zones are distinguished, within or outside campus classes. The graph shows that the interaction with the course content – access to videos and text material – mainly occurs during classes' hours.

The graph shows that the actions/h decrease as the course evolves. However, there is an exception to this trend in Project5. The reason for this increase may be due to the content level of this project. Until Project4 students had programmed Arduino IDE and the Project5 first introduced the Python programming language. This new development was associated with an increase in the difficulty of assessing the project and can be one of the main reasons for the rise in the number of interactions with the course content for this particular case.

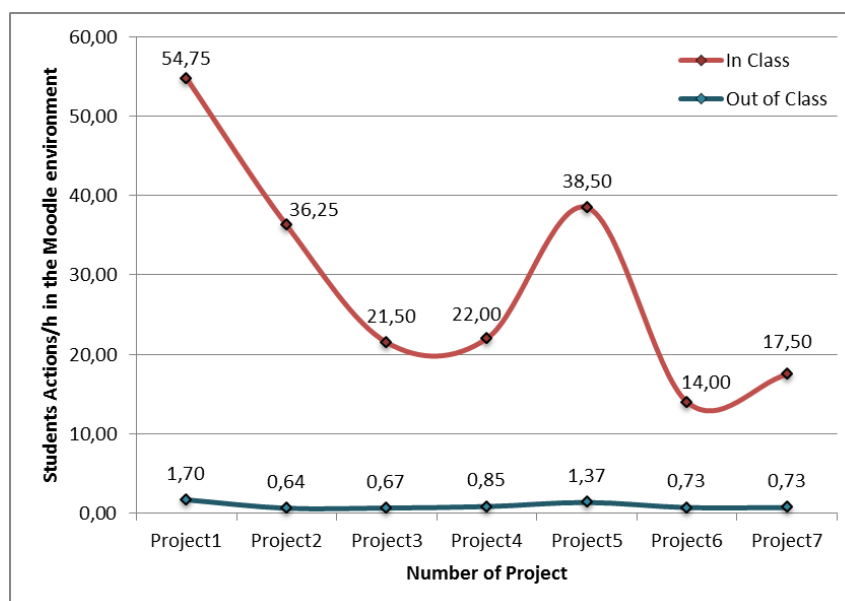


Figure 2. Students actions per hour in the online Moodle learning environment depending on project.

Flexibility in viewing videos

Figure 3 reflects the time when the students watched the videos of each project. Every row is a student and the group number to which belongs is also indicated, there are seventeen students divided among seven groups of work and in addition, legend shows which colour represents each video project. The data of this plot was collected from Youtube Analytics tool and from the Moodle Log Files.

Nearly all the students affirm in the surveys that when they watched the videos within class they did it together with another classmate. This would explain that some student have not seen all the videos, because, when they viewed a video with a classmate, a unique student registration of view is shown in the graph.

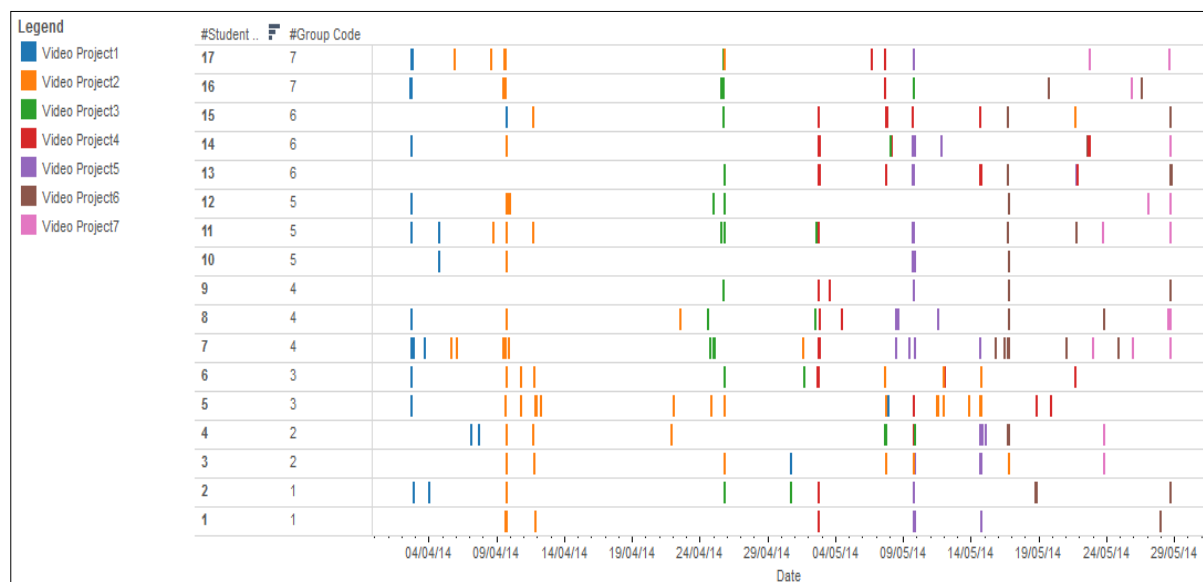


Figure 3. Video views of the students in time depending on project.

The main result observed from the figure is the difference in the times at which the participants watch the videos. Each student has seen the video at different moments – even on different days – and most times she or he has displayed the same video more than once. Students show to take advantage of the flexibility in viewing videos, according to their pace when completing the projects (being able to self-organize their schedule depending on their duties in the others subjects, etc.).

Videos have increased student's autonomy

Most of the students stated that the videos have helped them to become more autonomous (Table 1). The result was also reaffirmed by the main professor during the interview. He observed that the students of this course were more autonomous due to the videos: dependence of the students towards the teacher was lower than in previous editions of the course.

Table 10: Relationship between videos and autonomy of students

Videos have helped you to become more autonomous?	
Strongly agree	73%
Agree	20%
Indifference	7%

The results of the observation protocol, in addition to the surveys indicate that the interaction between the different working groups was low. Interaction mainly occurred among students of the same group or with the teacher. The most frequent questions to the professor were related to the practical course content or programming questions. Finally, student satisfaction

results with the course indicated that 93% of students have fulfilled all or practically all their initial expectations as well as they assessed the utility of the videos in 3.64 out of 5.

Discussion

Students interacted with the course content mainly during class hours, despite the fact that they had the opportunity to watch the videos before the sessions. Hence the flipped classroom was not present though it was the expected situation. Students used videos as support material within class while they were working on the projects at their pace.

On the one hand, the incorporation of videos in class allowed students to enjoy a great flexibility to access the professors' explanation. The advantage of this flexibility questions the use of oral teacher presentations in class because of the latter are governed by schedule that means that the students cannot access to this explanation beyond the class in the moments when their application is more significant. These conclusions are somehow in line with claims by other researchers saying that the role of presence-based learning may be re-thought, standard lectures do not take advantage of having the students personally present in the class (Marwedel & Engel, 2014). However, the use of video allows access to content "on demand". Moreover, the use of videos has helped students to become more autonomous.

In a learning design based on the student as in our case, the flexibility and autonomy that provide videos – used as support material during classes – help students to have more control over their own learning process and, therefore, the role of the teacher as facilitator is reaffirmed.

Limitations

Above mentioned findings must be interpreted in light of limitations of the study. The first limitation of this research is that this is a case study and therefore it is difficult to extrapolate the findings and generalize. In order to counteract this limitation, it has been placed emphasis on achieving a good internal validation of the results. The second limitation is the type of course of our case: a subject in electronics and programming - essentially practical. Classroom attendance facilitates the resolution of practical problems related to circuit assembly and programming more effectively than virtually, since they are very specific problems, difficult to predict. This conclusion is reinforced by the data obtained from the interviews and online surveys.

Other limitations are due to instruments used in research, basically derived from the surveys. This research study required from the volunteer participation and involvement of the students. Every effort was made to reduce the burden on the students. The questionnaires were integrated in the online learning environment to make them easily accessed. In addition, the instructors periodically reminded the importance of collaborating with this research.

Conclusion

Contrary to common belief, the use of video-based learning may not only converge in the use of flipped classroom methodology. It is also possible to use the videos in a hands-on class as a support tool that encourages a more autonomous, flexible and significant learning. The application of a flipped or a hands-on classroom approach depends on diverse aspects, including the nature of the course (with practical or theoretical orientations), the behaviour emerging from the students (depending on their needs and preferences, time constraints, etc.) and the design of the activities proposed by the teachers (strongly requiring students to watch videos in a certain timeframe, e.g. previously to the class, or offering flexibility). Future research considering variations of these parameters will help to understand the benefits and limitations of both approaches and to what extent they may coexist in VBL.

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MASTERING THE BLEND: STUDENTS' VALUE OF CLASSROOM AND ONLINE COMPONENTS IN A BLENDED ACCOUNTING COURSE

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Introduction

A top-scoring student dreams of becoming a chartered accountant, one of the most prestigious professions around. He is selected and enrolls for one of the most challenging programmes at one of a few universities that offer this degree. At the end of his first year he fails financial accounting, the subject that he has to pass through all his years of study as the cornerstone of his career. It is a devastating blow, and it will probably derail his future, as well as erode the reputation of the institution with the professional body, as in four years fewer professionals will be delivered to industry.

In higher education, improved outcomes and throughput rates are rigorously pursued, particularly in high-stakes subjects like the one failed by our unfortunate student. While massive investments are made into learning with technology in blended learning mode, the promised benefits seldom materialise. Merely using computer technology in teaching situations where the pedagogy remained the same has been shown not to improve learning outcomes (the no significant difference phenomenon) in study after study (Russell, 1999). A meta-analysis (Means, Toyama, Murphy, Bakia & Jones, 2009) has, however, found that recent students in blended learning mode did outperform their equivalents in traditional classrooms. They attributed this to blended learning students spending more time on their studies. In order to improve student success in pivotal courses, the promise of technology needs to be harvested, and blended learning unpacked and redesigned in a way that provides every student an excellent chance of success. There is a call for coordinated design research on how particular sections of the “blend” add particular value to learning (Roscorla, 2014).

Literature

In order to implement blended learning in a more effective way, the way students use different components need to be scrutinised. While descriptions of the characteristics and performance of blended learning practically do not exist, its definitions are criticized by prominent academics (Roscorla, 2014) as being narrow and one-dimensional. Blended and hybrid learning is defined by the Online Learning Consortium according to the amount of classroom time that is replaced by online activity while adding value (Mayadas & Miller, 2014). In practice, many so-called blended classrooms do not fit this definition of blended or hybrid, as

online activities do not replace any classroom time nor require meaningful out-of-class online learning, and can best be described as technology-enhanced classes. Researchers also found that adding technology to existing courses without concomitant changes in pedagogy resulted in no significant differences in student outcomes (Russell, 1999). The meta-analysis by Means and her team (2009) suggested that the improved outcomes in a blended environment compared to traditional classes were mainly due to students spending more time on their studies. The Garrison and Kanuka approach to blended learning of “the thoughtful integration of classroom face-to-face experiences with online learning experiences” (2004, p.96), where the emphasis is on integrating the strengths of activities from the two main delivery modes, remains valid. The core attribute of blended learning should be to improve the quality of student learning. Picciano (2009) proposes that blended learning can accommodate students with diverse needs, intelligences, personality types and learning styles. He calls for a purposeful blend of classroom and online activities informed by pedagogy that is driven by the course goals and objectives.

The biggest contribution to improving student outcomes is the work of Benjamin Bloom (1984). Inspired by tutoring, he showed a two sigma improvement on average in student outcomes after providing personalised corrective feedback in the areas where students had not mastered the requisite concepts or skills. The resultant Mastery learning process (Guskey, 2009), has been consistently successful in tutoring students in subjects such as mathematics. This approach translated well to computers as tutors, becoming an effective instructional aid. Programmes following individual differentiated learning paths show impressive learning gains and successfully reduce the achievement gap. While suitable programmes are not necessarily available, HE educators can still apply the principles of mastery learning to good effect in blended learning courses.

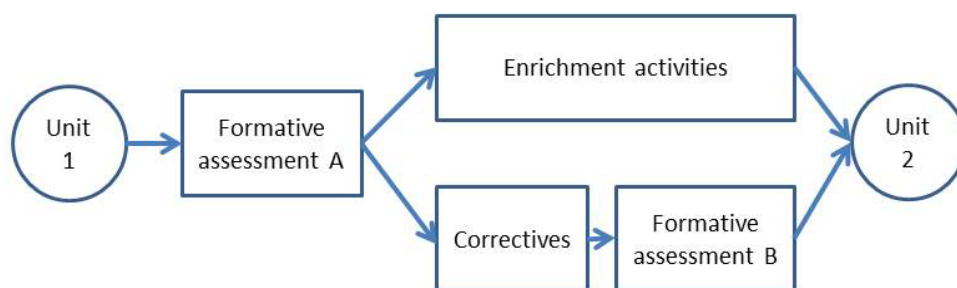


Figure 1. The mastery learning process (Guskey, 2009)

Addressing under-achievement in higher education is complex as students self-manage their time and learning activities outside class. Goda and co-workers (2015) confirmed that students' e-learning habits significantly influence their ultimate learning outcomes. Students who are in the habit of procrastinating have significantly lower scores than those with a learning habit (Goda et al., 2015). It is therefore suggested that a course which nudges students into more timely study habits could improve their grades. A mastery learning approach would encourage students to engage with the work on a regular basis.

Mastering the Blend: Students' Value of Classroom and Online Components in a Blended Accounting Course

Lynette Nagel, Louwtjie Venter

In spite of promises of blended learning being personalised, there is little research on how the blend of delivery modes actually tap into the way students construct knowledge. In order to compile the most successful blend of delivery modes for each learning component, designers should also take into account students' preferences. In a large study that cut across several disciplines, Paechter and Maier (2010) found that students preferred the online environment for practicing the skills of their subject and monitoring their own learning processes. They preferred the face to face environment for acquiring new skills and concepts and application of knowledge. The researchers also found that lecturer characteristics were among the few factors contributing to overall satisfaction with courses. High quality teaching material and students' attainment of expertise likewise added to their satisfaction.

Context

Financial Accounting was a pivotal module in the studies of chartered accounting first-year students and challenged even the brightest students, due to the high standards set by the professional body, SAICA. In the first year, students were selected on a high matriculation subminimum in one of the two languages of instruction at the University, as well as in Mathematics. Of the 570 students in the 2014 cohort, 130 had not taken Accounting as a school subject, and received supplemental instruction in order to complete both the school and university syllabi in one year.

Research had shown that students underestimated the importance of theory in the first year, which contributed to poor marks. In 2011 a mastery learning process (Guskey, 2009) was adopted in a blended learning approach, as the objective was to reduce the achievement gap of students who did not have accounting at school. Ten minute formative online quizzes were deployed in the LMS (Blackboard Learn™). These quizzes addressed the content of the past week or two's theory and focused on known misconceptions and troublesome concepts. Each question had feedback in non-technical terms to benefit the students who were unfamiliar with the terminology. The test which was available for a week, offered students a second chance in a batch of questions from an extensive question pool. Afterwards staff viewed the item analysis of all questions to identify concepts for re-teaching and further explanation in class. From the first implementation, the quizzes proved immensely beneficial, improving the pass rate to the same level as the students who had taken the subject at school (Nagel & van Eck, 2012). Students had to complete a minimum number of quizzes that contributed to their year mark. The quizzes were then extended to the whole class in the following year.

Supportive documents including administrative resources and sample questions and answers from multiple sources were provided in the LMS to coincide with current lecture topics. Some resources supported homework and preparation for classroom discussions, and formed an integral part of the expected learning process. Others provided enrichment and extra practice.

The research question of this paper is:

- How do different components of the “blend” contribute to student success?

The sub-questions are the following:

- What are the benefits of formative online tests?
- What is the value of providing supplemental online learning material?
- Which lecturer characteristics are most valued in the blended environment?

Methodology

A mixed methods approach consisting of questionnaires with itemised and open-ended questions was followed. In the Blackboard Learn™ LMS, the annual diagnostic end-of-class survey about the online quizzes was deployed with most questions probing the logistics of the quizzes like frequency, number of questions, difficulty, type and value of feedback. The LMS survey was completed by 333 students (57.6% response rate) and initial data were captured from the item analyses, and refined in Microsoft Excel™, comparing the frequency of the three response options across the six questions that dealt with the learning aspects of quizzes.

The second survey probing the usefulness of the other online activities and resources, as well as students' experience of the lecturer in the classroom, was deployed after the last exam. As students were not on campus anymore, the link to the combined survey, which was hosted on Qualtrics®, was distributed via an announcement from the LMS to email so students could complete the questions on any device, like smart phones. This questionnaire was completed by 316 students (55% response). Responses to the itemised questions in Qualtrics® were drilled down according to students' year -mark and compiled into contingency tables. Due to few responses from students who achieved less than 50, the cut-off point for pass or failure, all failing student response categories were collapsed into one. Chi-square analysis was performed on the contingency tables using the Social Science Statistics® website (Stangroom, n.d.). Replies to open-ended questions provided triangulation and context.

Table 1: Response profile by student year mark

Year mark	<50%	50-59%	60-69%	>70%
Response rate as % of achievement category	40	63	60	72

Table 1 shows that responses from failing students <50% were scarce while students with high marks >70% responded more readily. Considering that there was no reward for completing the surveys, we concluded that the high-achievement students were more motivated to respond than the others, illustrating that mastering knowledge likely motivates and satisfies students (Paechter & Maier, 2010).

Findings and Discussion

Online quizzes with feedback

We first analysed the online components of the “blend” in order to find out what value they contributed to learning. All students had access to the on-campus computer laboratories (results not shown), and experienced no barriers to completing the online quizzes. We report on the six questions about learning engagement with the quizzes that were selected from the LMS survey and probed the benefit thereof.

The pervasive success of the online quizzes in their present format is evident in the response to the first question in Figure 2, showing that nearly 70% of the respondents found the quizzes straightforward beneficial, and when added to the numbers to whom they were at least some of the time beneficial, 98.5% of the class benefitted from this activity. Drilling down into the detail, the metacognitive value of the quizzes were evident in replies to question 2, as a resource that confirmed for 67% how well they knew the work, and sometimes for another nearly 30% of students. The quizzes helped more than 55% of students to learn the subject (question 3), by focusing on the important aspects and helping them manage their time better (question 4), by focusing on the important aspects and helping them manage their time better (explanation from open-ended responses), an aspect that was sometimes true for another 42% of students.

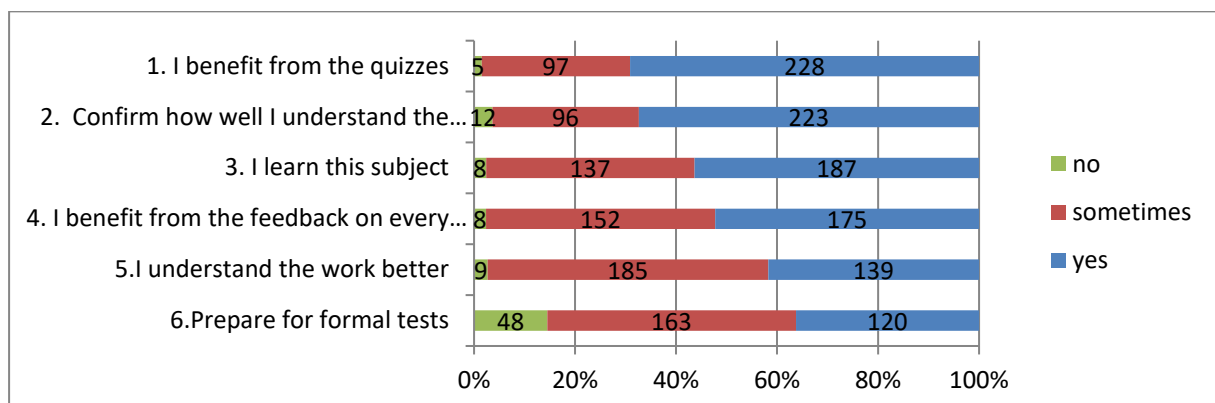


Figure 2. Student responses on what the online quizzes help them with (in %)

About half the respondents thought that the feedback in the questions helped them (question 4), while the other half only sometimes found the feedback beneficial and only 2.4% did not benefit from feedback. This finding is consistent with Bloom’s mastery learning theory (Guskey, 2009), that students who perform well on their first attempt at the assessment demonstrated that they had mastered the unit concepts, and did not need correction. The feedback (question 5) feedback was indispensable to understanding the work better for nearly 42% of the students, while it sometimes helped 56% of the respondents. Quizzes showed students which specific topics in the online resources to study further. Overall, online quizzes contributed strongly towards understanding the work and less to preparation for formal tests, true to their formative nature. Their most pervasive value was in monitoring students’ own progress, which is consistent with findings by Paechter and Maier (2010), whose students also preferred the online environment for monitoring their own learning. Formative assessments

helped in diagnosing areas that needed attention early on and keeping students up to date (open-ended responses), all consistent with mastery learning objectives (Guskey, 2009).

Online resources

We probed the usefulness of numerous other online resources that supplement and support the curriculum and help students understand the subject, in addition to the formal lectures. Students engaged with these resources in their own time. For this discussion the questions were grouped according to resources that would help students prepare for formal summative activities and those that supported understanding and learning. We calculated the average response regarding the usefulness of the 4 resources that help prepare for summative assessment, as well as those 4 that helped with understanding the work.

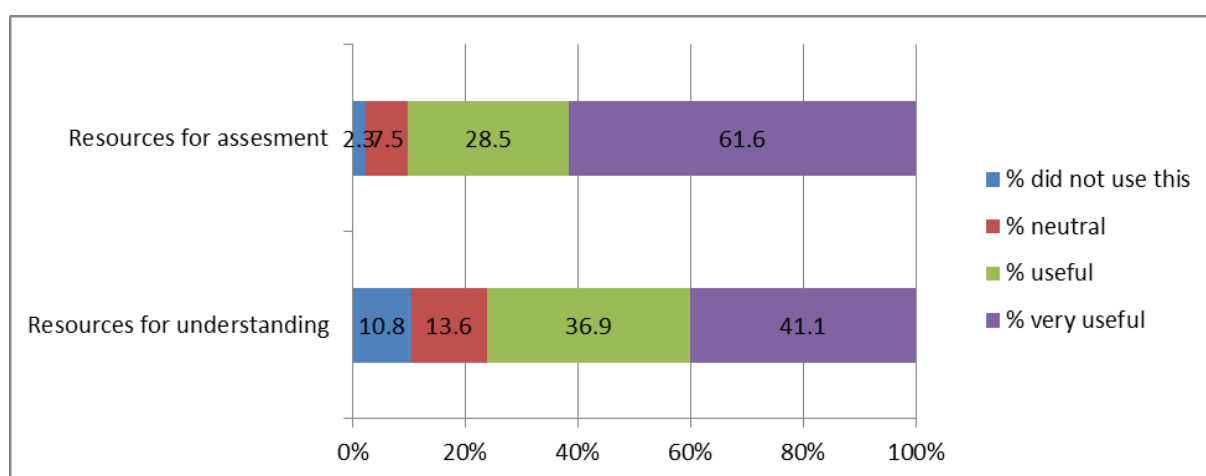


Figure 3. % students who found online resources for understanding and for assessment useful

Over 61% of respondents found the resources that were perceived to help them prepare for summative assessment very useful. The online resources that were directly associated with summative assessment, included: the answers to the questions in the prescribed text book, the availability of test papers and memoranda after tests, publication of the scope of tests and exams and online notices and announcements. 90.1% of the students found those resources useful or very useful.

Online resources that were reported to contribute to understanding and learning included the following: Summaries and explanations of topics, homework to prepare for lectures or work sessions, extra questions and answers based on questions asked by students in the classroom and extra questions and answers from old text books. Only 41.1% of respondents found the resources relating to understanding very useful, with 36.9% finding them moderately useful. These resources enriched and extended learning experiences, after students had feedback from the quizzes on where their knowledge gaps were. While 78% of the respondents found these resources useful to any extent, it was significantly less than the resources helping with summative assessment (90.1%). The real value of online resources were in preparing for summative assessment, as they provided enrichment and extra practice in a subject where

accuracy and speed are important skills, confirming findings by Paechter and Maier (2010), that students prefer online opportunities for practice and application of knowledge.

Lecturer characteristics

From the questions on lecturer characteristics and how they were valued by these students, we discuss the two that relate directly to preparing for tests and exams, and four that describe how lecturers help students understand the work, and calculated the average response for all the questions in each group.

Table 2: Lecturer characteristics: value of teaching for understanding and assessment

% responses	unimportant	neutral	important	very important	extremely important
For understanding	0.6	1.8	14.1	33.3	50.2
For assessment	0.6	2.6	21.2	31.7	43.9

Responses of the group as a whole (Table 2) showed that teaching for understanding was significantly more valuable than helping students prepare for assessment. When the responses were broken down into performance brackets, summative assessment was found to be of equal importance to students across all levels of competence, $P\text{-value} = 0.883027$. The value of teaching for understanding, as shown in Figure 4, showed a significant association with performance.

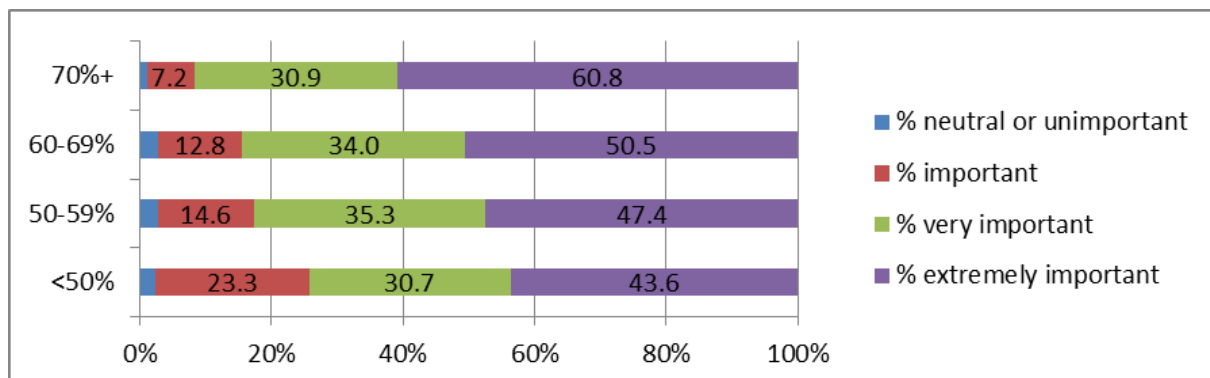


Figure 4. Distribution of responses to three questions about teaching for understanding among students with different levels of achievement

Figure 4 shows that the higher the students' marks, the more they valued their teacher's ability to help them understand the work. While this is shared by all, the degree of importance increases with increasing grades. These differences are highly significant at $p < 0.01$. (Chi-square statistic is 24.9247, $P = 0.003056$). Ross and Bell (2007) suggested that students achieved higher order (abstraction and application) outcomes better through contact instruction, whereas the cognitively lower order outcomes were equally well achieved using computer-based and contact instruction.

Conclusions

In HE students manage their own time, activities and online resources. Three aspects that contribute to satisfaction and motivation in blended courses namely lecturer characteristics, students' mastery of outcomes and quality online resources (Paechter & Maier, 2010) are shown here to be positively associated with student performance. A mastery learning approach contributed positively towards narrowing the achievement gap in a high-stakes and challenging course with outcomes in the cognitive domain (theory) and skills domain (analysis and calculation). As a self-paced activity, the majority of students intuitively valued formative assessments for the intended purpose namely understanding key concepts and staying up to date. Online resources that helped with administrative issues and organising and preparing for assessment were most highly valued. Online resources that provided examples and practice were used before a second attempt at quizzes and to prepare for summative assessment. The classroom component of the blend was most highly valued specifically for the teaching characteristics of the lecturer in explaining new and difficult theory, but there was a highly significant difference in the value that higher versus lower achievers placed on this characteristic, with the value of increasing with grades. There was no significant difference in how high and low achievers valued the lecturer's effort that prepared them for summative assessment.

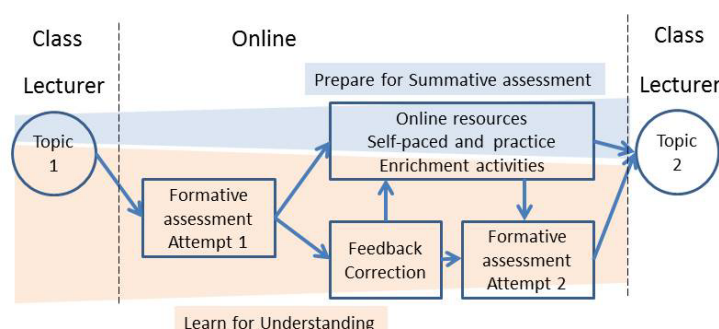


Figure 5. Proposed model for implementing mastery learning in a blended environment

We propose the following model, derived from mastery learning for similar subjects (Figure 5): For understanding new work students prefer the classroom and a teacher who explains theory and concepts well. The higher the student's own standards, the more they value this expertise. The next step is to monitor understanding, for which students prefer online formative assessment that explains misconceptions and shows gaps in knowledge, for which online resources are used. Thirdly, students value lecturers that help them prepare for tests, but they also prefer to use high quality online resources to practice and exercise their skills before tests and exams. Our findings illustrate the integrated way that students prefer to learn, moving between contact to online environments for preferred activities.

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EVALUATING THE QUALITY OF STUDENTS ACTIONS IN A DISTANCE LEARNING PROGRAMMING LANGUAGE ACADEMIC DISCIPLINE

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Introduction

Online learning (OL) has grown in importance as a direct consequence of the rapid development taking place in information and communication technology (ICT). This development has pushed OL agents into finding new methods of teaching and learning that could explore the technological media to the limits that ICT could actually offer. Due to the evolution of OL, it is difficult to find a precise and current definition. Nichols (2003) describes OL as “education that occurs only through the Web, that is, it does not consist of any physical learning materials issued to students or actual face to face contact. Purely online learning is essentially the use of eLearning tools in a distance education mode using the Web as the sole medium for all student learning and contact.” Though this statement is still valid, the notion of OL has evolved to include aspects such as collaborative learning (Garrison, 2009), connectivist learning (Anderson, 2003; Anderson & Dron, 2011) and online participation (Hrastinski, 2009).

This form of teaching and learning is very often based on the principles of student-centred learning; learning flexibility (spatial, temporal); and online interaction, in particular, asynchronous interaction, which blurs the temporal barriers imposed by communicational synchronism, and is consistent with the flexibility principle. Interaction is absolutely fundamental for the teaching-learning process so that students can effectively acquire the corresponding knowledge and skills. It occurs when students are actively participating in learning activities involving peer-to-peer and teacher communication, be it contributing in a discussion, solving an exercise, analyzing a result, simply exchanging views with their colleagues, or clarifying questions with the teacher (Graham, 2005; Pereira et al., 2007a; Pereira et al., 2007b; Tinoca et al., 2010).

One of the main research goals in online learning environments, according to (Oncu & Cakir, 2011) is enhancing learner engagement and collaboration. In distance education, online interaction is one of the most important practices that influence engagement and collaboration in the learner community. Anderson (2003) classifies interaction in 6 categories: learner-learner, learner-teacher, learner-content, teacher-teacher, teacher-content, content-content. Of these, the learner-learner and learner-teacher as well as the learner-content

categories are essential in modern learner-centred educational environments, and it is crucial to promote them in distance education, where the agents tend to become more isolated and these types of interaction are not commonplace or natural.

When teaching computer science in an online learning environment, we usually face increasing problems promoting student participation, when compared with other teaching fields (e.g. humanities). Students face natural inhibition in presenting publicly questions or issues that they consider to be of lower value or that expose their ignorance on more technical subject matters. Student's participation is often more than communicating a verbal opinion but to demonstrate a very specific technical issue. In fact, experience has shown that discussions are usually dominated by a small core of students with a greater mastery of the subject areas or who are less inhibited, which results in a reduced level of student participation.

Furthermore, online interaction of the learner-content type is more sophisticated in computer science, as it requires students to use specific computing resources or perform experimental work at virtual laboratories, using their own personal computers. This implies the design and implementation of improved forms of sharing computing resources and processes, as well as their individual and collaborative manipulation within a virtual class.

The adoption of e-learning tools and learning management systems has been, not surprisingly, prominent in the computer science field (Georgouli, Skalkidis & Guerreiro, 2008; Murphy, Phung & Kaiser, 2008; Renaud, Barrow & le Roux, 2001). However, most approaches tend to use these tools as an extension to traditional face-to-face courses, or as a way to simulate real classes, e.g. by providing students with recorded lectures and digital versions of slides (Huan, Shehane & Ali, 2011; Matthíasdóttir & Harðarson, 2005). The potential for collaboration and interaction over the Web is rarely used, as instructors tend to think in terms of enhancing or replacing their usual way of teaching. Rosbottom (2001) pointed out some of the problems with teaching computer science at a distance (such as drop-out rates), and how Open Universities have been finding new ways to overcome these problems by fully exploring the communication speed and genuine collaborative work provided by the Web.

When learning online, many students have a passive attitude towards their classmates and teachers, as they think that everything they need to succeed will be provided via the learning management system. Thus, an important research question that we address in this paper is what tools and strategies could be used to reduce or eliminate passive engagement of students and promote their collaborative involvement in online learning.

To teach how to program with an object-oriented language (like C++) is normally not a simple task. It is especially true when the students do not have any programming background or previous experience with any other programming language. Even those students that are used to program in a procedural approach find some difficulty to change the way they reason to solve a problem under the object-oriented paradigm. This reality is quite recurrent in any

programming language teaching class anywhere around the world where the students are on-campus studying. Things can become a little bit more complicated when you have to teach object-oriented programming in a totally e-learning environment.

Despite recent advances of electronic technologies in e-learning, a consolidated evaluation methodology for e-learning applications is not available. Maybe the main cause for this is the complexity that the evaluation of an e-learning environment demands. Many different perspectives (Ardito et al., 2006) and thus dimensions, in the analysis process can be considered, such as the quality of: learning, teaching, learning environment and interaction. Each of these dimensions can be evaluated according a group of pre-defined and chosen indicators. In the case of interaction, we may consider that the quality of students' interaction is one of the most relevant indicators.

This article presents the main results obtained through the analysis of the students' actions while interacting and using the object oriented programming discipline available on the Moodle platform of Open University (UAb) of Portugal to the students of the 1st cycle in Computer Science degree. All teaching and learning activities were developed online (emphasis on asynchronous communication) and this discipline is taught in the first year of the graduation (second semester).

Background

E-learning systems store large amount of data based on the history of users' interactions with the system. These pieces of information are usually used for further course optimization, finding e-tutors in collaboration learning, analysis of students' activities, or for other purposes. The interest in scrutinising this data better is gradually increasing inside academic community.

Slaninová et al. (2012) present the comparison of selected methods for the definition of students' behaviour with the focus to influence of dynamic time warping. Obtained patterns and relations between them are presented using complex networks; the visualization and pattern clusters extraction is optimized by spectral graph partitioning.

Hogo (2010) introduces an evaluation methodologies for the e-learners' behaviour that will be a feedback to the decision makers in e-learning system. His work presented the use of different fuzzy clustering techniques as fuzzy c-means and kernelled fuzzy c-means to find the learners' categories and predict their profiles.

Rovai and Barnum (2007) analysed nineteen on-line graduate courses in order to determine how perceived learning varies by course and its relationship to active and passive participation by students in on-line discussions. Study results provided evidence that significant differences existed by course, suggesting that quality assurance is an issue in Internet-based instruction. Moreover, female students felt that they learned more than their male counterparts. Only active interaction, operationalized by the number of messages posted by students per week,

was a significant predictor of perceived learning. Passive interaction, analogous to listening to but not participating in discussions and operationalized by the number of accesses to the discussion boards of the e-learning system each week, was not significant.

Sriwardiningsi and Siswono (2014) conducted a survey on 274 e-learning students from Online Binus University and Indonesia Open University (UT). Ten hypotheses were proposed but only some hypotheses were valid. Variables such as motivation, digital literacy and satisfaction would affect directly to the attitude of und understanding student learning, while the curriculum material product and interaction e-learning website did not influence the understanding student e-learning attitude.

Although these works focused on analysing e-learning student's behaviour, none of them actually looked at it in terms of Moodle usage, nor in the context of a typical programming discipline. This article focuses exactly on this and tries to perceive better how they explore the content that is made available to them.

Discipline content and organization

The object oriented programming discipline aims at providing students with fundamental knowledge and practices regarding the principles, main concepts, models and main techniques related with computer programming based on the object-oriented paradigm. The teaching of the discipline syllabus adopt the analysis of the object-oriented programming paradigm, algorithms and blocs of code as also several techniques, looking for correct way to solve problems throughout object-oriented programming, while students are also stimulated to design and implement new approaches or improvements of existing ones. The programming language and environment adopted are C++ and Eclipse IDE, respectively.

It assumes a total workload of 156 hours, being 26 contact hours. The students' assessment is done through 2 digital written documents (called e-folios) during the semester and a classroom assessment (called p-folio) in the end of the semester. The e-folios contribute 40% to the final grade, while the p-folio, 60%. They can also be assessed through a unique classroom exam. If they fail, they have a last chance of being approved with an appeal exam.

The Moodle environment of the discipline is composed of 7 topics, in which the student faces an increasing degree of complexity, and is asked to execute always a learning activity (that does not compute to the final grade and is not obligatory). Each topic lasts 2 weeks and didactic material (with vast examples of codes and relevant links, and even videos) specially developed for the students are made available, besides the solution of the learning activities and e-folios. All the topics have a forum where support to the topics content is guaranteed by the teacher asynchronously. The teacher always answer the questions within 48 hours (weekend) or in daily basis (from Monday to Friday), besides stimulating the students to participate. The discipline had a total of 124 students subscribed and two classes, each with 62 students. It took place in the 2014 academic year.

Analysed data

The data was extracted directly from the Moodle platform, through its reports facilities. The activity record report gives detailed information about each student actions along the year. It informs what, when (date and time) and from where (IP address) he has executed some interaction with the discipline.

Although we had 124 students subscribed (7 female and 117 male, 9 from outside Portugal), only a small part of them actually attended (32%) and were approved in the discipline (26%). The period of time considered is from March to November of 2014. Figure 1 shows the total number of students that interacted per month on Moodle. In March, a total of 72 students executed some action, although only mostly half of them actually tried to be approved and by July (end of the semester) only 32 remained active. The Table 1 illustrates de scenario we had and the respective figures:

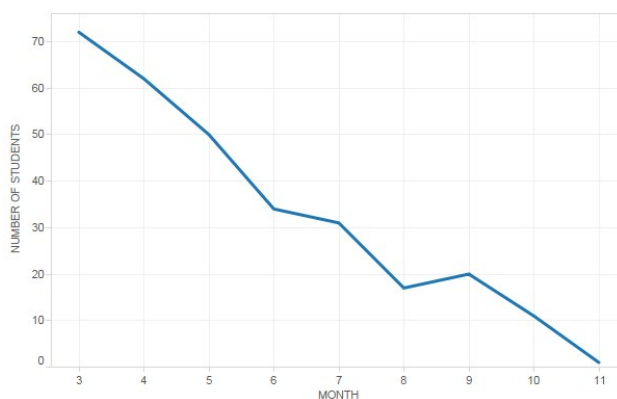


Figure 1. Total of students interacting per month

Table 1: Totals of students in the discipline along time

Scenario	Totals
Subscribed students	124
Interacting at least once with the discipline	115
Did e-folio A	35
Did e-folio B	30
Did p-folio	27
Did only final exam	5
Did appeal exam	2
Approved	31
Highest number of accesses per student	529
Average number of accesses per student	153
Minimum number of access per student	1

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Actions in the Moodle can be one of those (total of 31, and in the context of this discipline, it is supposed that they have some interaction especially at those actions marked with an asterisk:

- assign submit (*);
- assign view (*);
- assign view all;
- assign view submission grading table;
- assign view submit assignment form;
- book print;
- book print chapter;
- book view (*);
- book view all;
- book view chapter (*);
- choice choose;
- choice choose again;
- choice view;
- choice view all;
- course view (*);
- folder view (*);
- folder view all (*);
- forum search (*);
- forum subscribe all;
- forum unsubscribe all;
- forum user report;
- forum view forum (*);
- forum view forums;
- IMSCP view all;
- label view all;
- page view all;
- resource view (*);
- resource view all;
- URL view all;
- user view and user view all.

After the extraction, the data was treated to find out totals, average values and detect potentials tendencies. Based on the numerical analysis, some graphs were produced to more easily evaluate the results that were being obtained.

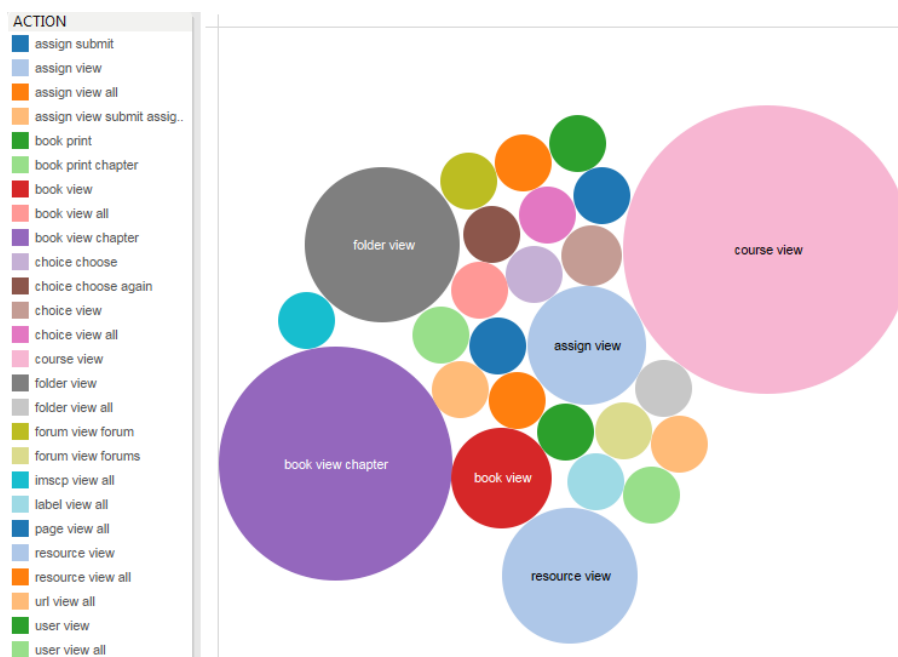


Figure 2. Totals per actions

The Figure 2 illustrates the totals per actions. Course view (38.5%) is the most recurrent action performed by the students followed (in this order) by the book view chapter (17.5%), folder view (12.5%), resource view (10.5%), assign view (7.8%) and book view (3.4%). All the other actions are less significant and have approximated the same total values. The course view is an entry each time the student simply accesses the discipline space in Moodle, but the book view chapter, means that they are constantly consulting the planning (time table) of the course and its overall schedule and content description. The folder view action indicates that they repeatedly open folders to download didactic materials and solutions of learning activities and e-folios, while the assign and resource views points out their interest in viewing the learning activities proposed (although, most of them do not solve it).

Figure 3 show the total number of actions only by weekdays and by weekdays per months. Most of the students in UAb are workers with average age towards the 30-40 years old. Surprisingly, the weekend isn't when the highest accesses happen, but instead on Monday (24%). Topics are usually made visible to the students on Mondays and e-folios, on Fridays. Along the time we can also notice that the activity decreases significantly and although Monday is always when more actions are registered, in April, Tuesday has slightly more actions, while Thursday, Friday, Saturday or even Sunday, have almost the same number of actions.

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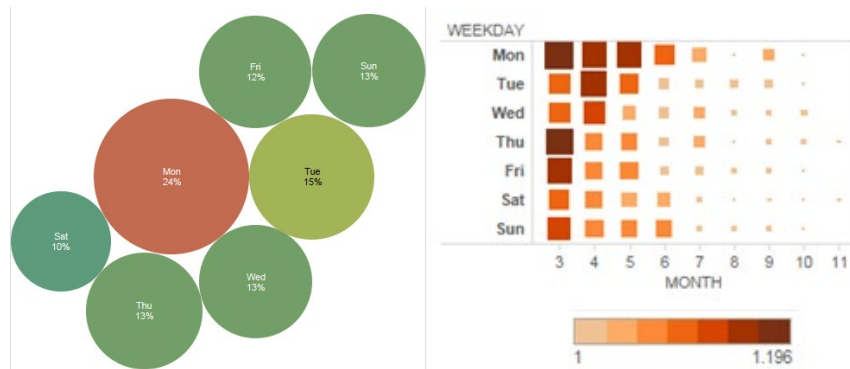


Figure 3. Totals actions per weekdays and per weekdays x months in the period

In terms of time, Figure 4 illustrates the total number of actions along each day in the period as stacked totals of each weekday. The students' actions indicate that they gradually increase their number of actions between 19-22 pm, decreasing their activity after that time. There is also some expressive increase in lunch time or between 7-10 am, being totally coincident with the general profile of our students (employed people) who are more active in less demanding working hours.

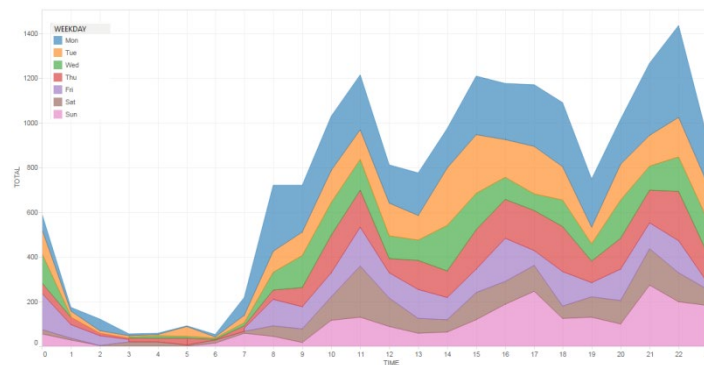


Figure 4. Totals actions per time in the period and per weekday

The decrease of participation and thus interaction of the students increased significantly along the time. Although some of the graphs before already give a hint of this, taking a close look at the most repeated action (Course view), it is more clear the decrease of the rate of participation of the students. In March, 61% of the students that at least has accessed the discipline once were active. In July, this figure drops to only 26%. Figure 5 gives a better view of this happening through tree-maps charts.



Figure 5. Course view action execution during the period and per weekday and time during the period

Conclusions and further work

Based on the results, it is clear that the drop out of students is very high, although most of all of them accesses the discipline and do some minor interaction at least once. The quality of their interaction is very low in terms of using (posting or/and reading) the several forums available for asynchronous communication. For instance, only a set of 30 students actually accessed a forum. The highest times that action forum view forum was executed by a single student (from those set) was 16 and an average of 3 accesses was the average result to the set as a whole. This reveals a total failure of the main pillar on which the e-learning model relies.

Another interesting outcome is that only 38 students have accessed at least 182 times (in different dates) the discipline. If we assume that they spent 1 hour per day on the platform, this reveals that these students were more interested in navigating and participating actively than those with lower figures (the other 77). If we assume this rate of usage, this figure also indicates that these 38 students exceeded the expected 156 hour of workload only while interacting with the platform (the highest number of times was 529). In fact, most of this group of students was those that actually tried to be approved on this object-oriented discipline. Figure 6 illustrates the relation between final grades of the students that were approved and the total number of actions they did. The two students with highest grades (20) were those with the smallest number of actions, while in general, the approved group had a total number between 200-400 times.

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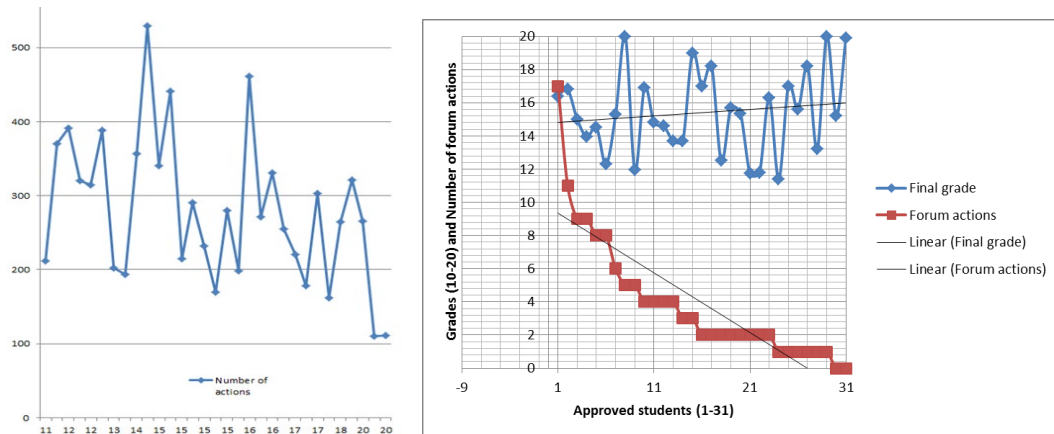


Figure 6. Number of total actions per final grades of approved students and final grades x total of forum actions per approved student

An additional significant outcome is that a divergence occurred between the grades and the number of total forums actions. The interaction through the asynchronous forums is another key premise behind the e-learning model. We can notice clearly in the chart below (Figure 6) that the highest grades were achieved by students with very low number of forum actions (post messages or open forums possibly to read messages).

In general, based on the results, we can assume that the quality level of the students' interaction is low than it was expected or supposed to be the ideal. This indicates that possibly the e-learning model is not well tailored to work with disciplines such as those were programming languages are taught and other didactic and pedagogic strategies, have to be added in this case. The introduction of regular synchronous meetings or the development of multimedia content to teach interactively how to program may be future ways to explore (using virtual and augmented reality, for instance). One very important conclusion is the significant underuse of the forums by all the students, and mostly, the lack of evidence that their underuse leads to fail in being approved.

Another vital thing to do is to run a survey to understand better what limitations and drawbacks cause so many students to drop out or to have such a low quality level of interaction in the distance learning environment in the case of object-oriented programming. Also a future work will be to compare these results against those achieved from other programming disciplines that the Computer Science degree offers in UAb.

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THE URBAN GAME MOBIGEO: STUDENTS PERCEPTIONS ON POTENTIAL AND CONSTRAINTS OF AN MOBILE OUTDOOR EDUCATION

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Introduction

Mobile technologies are increasingly rooted in society and, therefore, intuitively, teachers begin to take advantage of devices that students carry with them daily in a logic of 1:1 bring your own device (BYOD) (Herro, Kiger & Owens, 2013). In fact, as mentioned Vieira and Coutinho (2013) “The evolution of the society gave to the mobile phone an importance that goes behind the typical communication between people. It becomes imperative to use this media to promote/increase new activities that are motivating and challenging for students”, but BYOD programs are controversial, as schools grapple with technical support for nonstandard devices, concerns over equity, issues of classroom management, and pedagogical approaches (Dahlstrom & di Filipa 2013).

Our research arises due to the emergence of a new paradigm for learning “just in time” and “anywhere” featuring the Mobile Learning that, as suggested by Kukulska-Hulme and Shield (2008), Moura (2010a) or Sharples et al. (2009) point to constitute an opportunity to go beyond the classroom barriers and extend the process of teaching and learning to a custom context where the virtual and real worlds merge.

According to a literature review (Vieira, 2014) and agreeing to Kukulska-Hulme and Shield (2008) and O’Malley et al., (2005) mobile computing activities are mostly confined to the classroom and this is reductive, so is necessary to frame the context shared by the device itself and the user/learner mobility. Thus, according to O’Malley et al., (2005) Mobile Learning occurs when the learner “is not fixed” and when you take advantage of the learning opportunities that mobile offers.

This was the inspiration to create the MobiGeo, an Urban Game implemented in a basic school, with Geography subjects, involving pupils and teachers and also policy makers in the region where the study was implemented. Sharples (2010) emphasizes that the knowledge of learning in context and out of the classroom is small and if we add mobile technologies, then we have an even more weakened frame, in terms of what is the investigation and that justifies the contribution of the study performed.

The aims of the research was to design, implement and evaluate an Urban Game with Qr Codes and thus allow for teachers to rethink and innovate their teaching methods based on a the adoption of mobile computing, and in that sense “understand that being a teacher is feeling the need to adapt our teaching method to reality, full of emerging technologies and with which students like to deal with” (Cruz & Meneses, 2014, p.283).

The research question that guided the project was to understand whether the implementation of an urban game – Mobigeo – that enhanced collaboration and interaction among peers could influence the process of learning geography in an outdoor education context.

After reviewing emerging research on m-learning, this article presents the results of two open-questions of a survey implemented to 173 students who played the MobiGeo

Mobile Location-based Games

Mobile computing allows for new educational activities that combine technologies and contextual learning. Accordingly to Sharples et al. (2009, p.4) context “is a central construct of mobile learning, not as container through which we pass like a train in a tunnel, but as an artefact that is continually created by people in interaction with other people, with their surroundings and with everyday tools”.

One of these educational activities is “mobile location- based games” who relate to the location/mobility of user raises and are mediated by mobile phones (Avouris & Yiannoutsou, 2012). A typical example of these games is the “urban game” or “street game” that are a phenomenon of modern societies. According to Avouris and Yiannoutsou (2012) “these games are played in physical space, but at the same time, they are supported by actions and events in an interconnected virtual space”, which can be classified into three categories: i) the ludic that are games created just for entertainment; ii) pedagogical: games with well-defined learning objectives, which may occur in and out of school; and iii) hybrids that include both the educational and entertainment aspects, conducted in informal learning environments that normally is associated with cultural and historical aspect of society. According to Silva and Delacruz (2006), being in direct contact with the contents to assimilate and move in a real context, students have a more significant learning and this enhances the mobilization of knowledge in different contexts.

In the same way, Benford (2005) considers that “location-based mobile experiences” offer several advantages and a great educational potential, including:

- Chance to learn in particular context, being able to choose where and when, for example, when students study questions related to the History of Art may access the thematic content when they are in front of a characteristic building;
- Data collection *in situ*, i.e. allows students during fieldwork examine or submit data on a site for further interpretation;

- Personalization of learning experiences, because the students can access content according to their own learning time, with no pressure from the collective.

Research guiding classroom implementation with mobiles is scarce and merely illustrative (Herro, Kigger & Owens, 2013) but there is even more need of research on the use of mobile computing in outdoor education that is the focus of the research presented in this article.

The teaching of Geography

The teaching of geography requires a variety of educative resources and geographical analysis tools. Traditionally, educational experiences were supported in the consultation and analysis of printed maps and atlases and statistical database. With technological developments, emerge the insertion of projectors, video/DVD players, satellite images, among others. However, although we examine the skills that are required of students (Ministry of Education, 2001), we find that the vast majority could be developed through the use of Geographic Information Systems (GIS).

Wheeler et al. (2010), mention that the fundamental tool of geography is the map and that over 75% of the world information is georeferenced, hence the geographical knowledge is fundamental.

Students faced with the GIS are “forced” to think spatially, automatically assimilate this notion, and also the interpretation that will provide the development of geographic reasoning.

David (2007), based on Wiegand (2005) and Mitchell (2007), states that geography must be taught with the use of all available technologies, following thus the very evolution of territorial research tools, with natural relief for GIS, and must be present in the education curriculum of Geography teachers.

Design of MobiGeo

The theoretical background of the Urban Game designed in our research is based in four pillars: Constructivism (the student takes an active role in the production/construction of knowledge), the Situated Learning (authentic context is a sponsor of knowledge); Connectivism (which puts mobile devices as a source of connections available for the acquisition of knowledge) and Conversation Theory (Vieira, 2014; Vieira & Coutinho, 2014).

The urban game “MobiGeo” was idealized for the research and had as main thread the history of the European Union and intended to combine learning and entertainment. Its preparation respected the principles suggested by Herrington et al. (2009) to:

1. real world relevance: use Mobile Learning in authentic contexts;
2. mobile contexts: use Mobile Learning in contexts where learners are mobile;
3. explore: provide time for exploration of mobile technologies;
4. blended: blend mobile and non mobile technologies;

5. whenever: use Mobile Learning spontaneously;
6. wherever: use Mobile Learning in non traditional learning spaces;
7. whomsoever: use Mobile Learning both individually and collaboratively;
8. affordances: take advantage of the characteristics of mobile technologies;
9. personalise: planning the use of the devices owned by the learners themselves;
10. mediation: using Mobile Learning to mediate knowledge construction;
11. *produse*: using Mobile Learning to simultaneously produce and consume/use knowledge.

The MobiGeo arose from a partnership between the Basic School (“Agrupamento de Escolas de Vila Verde”) and the Knowledge House of Vila Verde (Casa do Conhecimento de Vila Verde). In this Urban Game participated all classes of the 7th grade of the Public Basic School of Vila Verde, a total of 173 students (82 boys and 91 girls), with ages between 12 and 15 years. Each school class was divided in four teams – GeoFronteirs, PDA, Support and Wallpaper – and the geographical area was bounded between the school and the Central Square of Vila Verde a space with wireless system (Digital Plaza). Mobile phones were also available for each of the teams to communicate and receive instructions of the path to go (GPS) and the tasks were associated with QR codes. In the end of the route, the team that concluded all the points and performed all the tasks had to raise the European Union flag as a symbol of victory.

Method

To assess students perceptions on the MobiGeo the researchers developed and validated a questionnaire adapted from a proposal of Savi et al. (2010) entitled “Model to evaluate Educational Games”. The model takes into account the motivational model of Kirkpatrick (level 1) and embraces three major dimensions: Motivation/Interest, Interaction and Perceived Learning.

The questionnaire included both closed ended questions in the format of a 5 points *Likert* scale of 5 degrees of agreement (Completely Disagree, Disagree, Indifferent, Agree and Completely Agree) and also 2 open-ended questions asking students opinions on the MobiGeo game. The analysis was undertaken using SPSS software for closed items and content analysis techniques were used to categorise and interpret the open-ended questions. In this paper we focus the analysis of the qualitative data of the questionnaire that asked students to mention the strengths and weaknesses of the learning activity.

The exploratory content analysis carried out followed an emergent process of coding and categorization based on the answers provided by the students. Four categories were considered for the positive features of MobiGeo (use of technological devices, interaction, learning achievement and informal context of learning) and two for the suggestions to enhance the game (technological devices and activity organization).

Results

Table 1: Categories and sub-categories of the question of content analysis 1 of Section III of the questionnaire

Questions	Category	Subcategory	Frequency
Strengths of the Urban Game MobiGeo	Use of technological devices	Mobile Phone	64
		Computer	17
		Internet	14
		QR Codes	6
		GPS	4
	Interaction	Team Work	59
		Communication	8
	Perceived Learning	Learn geography/European Union	28
		Informal Learning	21
	Informal learning context	Activity outside the classroom	50
		Context of the activity	30

The results listed in Table 1 show that the main strengths of MobiGeo were the use of mobile phone (which are somehow associated the QR codes and GPS), the teamwork, the fact that it is performed outside the classroom (contextual) and the possibility it offered to learn geography in a different manner. What can be evidenced in their comments:

- “... The cell phone use led to the commitment of the group”;
- “... We can enjoy the activity to interact with our colleagues and learn”;
- “The MobiGeo activity allowed the cooperation between students ...”;
- “... Learn more about the European Union”;
- “... We have learned by playing”;
- “... Learning was easier”;
- “Be out of school made the activity different”;
- “Interacting with the environment ...”.

We can infer that the mobile phone with the GPS application had a leading role and served as the link between the real and virtual world. An important aspect was the context in which the MobiGeo was done because as regards Sharples et al. (2009), the context is crucial in the development of Mobile Learning because it is constantly under construction by the people and allows interaction of those acting on it.

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Table 2: Categories and sub-categories of question 2 content analysis of Section III of the questionnaire

Question	Category	Subcategory	Frequency
Suggestions for improving the MobiGeo	Technological devices used	Internet	50
		Mobile Phone	18
		Computer	10
	Organization of MobiGeo	Tasks / georeferenced points	33
		Activity duration	15
		Time of game	13
		Local	13
		Teams	12

The second question (Table 2) asked students to suggest improvements to the MobiGeo, so they mentioned, at the level of technological devices used, that the Internet and the mobile phones were items that need more attention. Also noted that the activity should be increased with more tasks and therefore last longer. It should be noted that 33 students mentioned that they had nothing to improve in MobiGeo. We support these results with some examples of student answers:

- “The Internet could be faster”;
- “Mobile network could be better in some places”
- “Enter more tasks to last longer ...”;
- “... Have more activities along the way”;
- “... Want it all day”.

Final Remarks

We consider that the data obtained allow us to say that the Urban Games, like MobiGeo are potential agents of motivation and interaction that predispose students to learn geography in an informal environment, as was our case. Mobile technologies offer a range of learning experiences that may involve and effectively educate students, we can still say that the success of Urban Game MobiGeo was due to the challenge of finding out what is hidden in the georeferenced location and mobile phone use to uncover this message, because as students mentioned “the use of mobile phone motivated the commitment of the group” also assumed in the strengths of MobiGeo, “the points are located at the GPS”, “the use of QR codes” and “have used wireless internet “.

This is why schools rather than prohibit, should create a culture of “mobile literacy” (Shuler, 2009) in which the primary consideration should be to develop a set of skills that exploit the potential of these devices and thereby bet in new teaching strategies. The roles of teacher and student, should not be abandoned but recycled and adapted to this new reality that requires a more personalized and diverse learning, as stated Moura (2010b, p.501) “the goal is for the student to participate in the learning game and that participation was effective, both in solving tasks, such as the activities of suggestion”.

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TYPES OF PARTICIPANTS' BEHAVIOURS IN A MASSIVE OPEN ONLINE COURSE

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Introduction

In recent years, there has been a proliferation of Massive Open Online Courses (MOOCs). Initiatives like Coursera, edX and Udacity provide platforms for higher education institutions to develop and deliver online courses to the general public. These courses are usually offered free of charge, with no preconditions or commitment, and attract massive numbers of registrants from around the world. From a pedagogical perspective, the courses (sometimes referred to as xMOOCs) follow a cognitive-behaviourist approach (Rodriguez, 2012; Daniel, 2012) and consist of diverse learning resources such as reading materials, video lectures, discussion forums, and assessments. Some courses give participants a statement of accomplishment or certificate upon successful completion of course requirements.

A central criticism about MOOCs refers to the relatively low completion rates of participants (Kizilcec, Piech & Schneider, 2013) with 10% or less of the course registrants earning a statement of accomplishment (Daniel, 2012; Breslow et al., 2013). Ho et al. (2014) argued that certification rates are a misleading representation of the diverse ways in which registrants are engaging with MOOCs; certificate earning is only one possible way, while others may include watching videos, reading texts, focusing on assessments, and so on. Kizilcec et al. (2013) argued that the categorization of MOOCs learners into those who pass the class, and everyone else, makes no allowances for learners who choose to stay engaged with the course and participate in some aspects of it, without earning a certificate.

Subsequently, the purpose of this study was to gain more insights into different types of participants' behaviours in MOOCs, by analyzing non-certificate earners' (NCEs) and certificate earners' (CEs) behaviours. Using a data mining methodology, the participants of a MOOC were classified into clusters, based on their activity in the main learning resources of the course: video lectures, discussion forums, and assessments. Thereafter, the different types of engagement and behaviours that emerged in the clusters were analyzed.

Background

Participants' engagement in MOOCs

Large-scale participation in MOOCs, together with data collected from the participants' interaction with the course, open up opportunities for studying student engagement at scale (Ramesh, Goldwasser, Huang, Daume III & Getoor, 2014). Several studies have examined the types of engagement and persistence of participants in MOOCs, based on different criteria. Kizilcec et al. (2013) identified four prototypical trajectories of engagement, based on the participants' actions in regard to the videos and assessments: learners who completed the majority of assessments; learners who did assessments infrequently, if at all, and engaged by watching video lectures; learners who did assessments at the beginning of the course, but then had a marked decrease in engagement; and learners who watched video lectures for only one or two assessment periods. Ho et al. (2014) presented another classification with four types: registrants who never access the courseware; non-certified registrants who access less than half of the available chapters; non-certified registrants who access more than half of the available chapters; and registrants who earned a certificate. Halawa, Greene and Mitchell (2014) identified four common patterns of persistence in MOOCs: continuous persistence, continuous persistence with extended absences, bursty persistence, and drop out.

Videos in MOOCs

Videos are a dominant medium in MOOCs, and are central to the student learning experience (Guo, Kim & Rubin, 2014; Diwanji, Simon, Marki, Korkut & Dornberger, 2014). The courses usually consist of several short videos, interspersed with quizzes. Glance, Forsey and Riley (2013) described the pedagogical principles underlying this structure as short videos that allow students to control the pace, to pause, to rewind, to explore and to return to the content. In addition, the format of short videos that cover a concept, associated with quizzes that provide formative assessment, enable the learners to engage in Mastery Learning - the possibility to achieve mastery of a concept before moving on to the next one, and Retrieval Learning - the act of enhancing long-term, factual memory by recalling information from short-term memory. Several studies have examined the use of videos by MOOCs participants. Some studies focused on the categorization of factors that affect students' engagement in the videos (Guo et al., 2014; Diwanji et al., 2014). Breslow et al. (2013) related to characteristics of video use by CEs.

Discussion forums in MOOCs

Discussion forums in MOOCs support social learning (Brinton et al., 2013). Online forums help to create a learning community through which learners generate knowledge (Li, 2004) and are intended to promote learners' motivation, reflection, and engagement (Onah, Sinclair & Boyatt, 2014). In MOOCs, the discussion forums constitute a primary means of interaction among the course participants and the instructors (Onah et al., 2014) with peer communication, support, and assessment becoming central, due to the large-scale participation versus the low number of instructors in a course (Onah et al., 2014). Nevertheless, when examining participants' engagement in MOOCs forums, the usage of

forums has been described as quite low, in general, with the discussion often involving a minority of course participants (Onah et al., 2014; Breslow et al., 2013; Ho et al., 2014). In addition, several studies have indicated that CEs are significantly more active in the forums than NCEs (Breslow et al., 2013; Kizilcec et al., 2013; Ho et al., 2014).

Assessments in MOOCs

MOOCs in their essence are open courses, thus, the course assessments are optional and may serve different participant goals, such as self-testing or receiving course credit. Due to the large number of participants in MOOCs, conducting assessments by humans is impossible (Glance et al., 2013; Sandeen, 2013) and different models of assessments are evolving. Among them are the automated quizzes with instant feedback, peer assessments, self-assessments, and machine grading. The automated quizzes are appropriate for subjects that can be assessed by objective means, whereas other methods are more appropriate for writing-based assessments (Glance et al., 2013; Sandeen, 2013). Breslow et al. (2013) noted that with free and easy registration to MOOCs, the courses include a large number of participants who may not have any interest in completing the course assessments. Ho et al. (2014) stated that many registrants engage in MOOCs without completing the assessments for credit.

The study

This study examined the different types of participants' behaviours in a MOOC, based on the participants' activity in the main learning resources of the course. The research questions were:

1. What are the types of engagement in the course?
2. What are the types of behaviours in regard to the course video lectures, discussion forums, and assessments?

Methodology

The study was conducted using a data mining methodology. Educational data mining is an emerging methodology that deals with developing methods for exploring the types of data that come from educational settings, and using those methods to better understand students and their learning environments (www.educationaldatamining.org).

The study examined one MOOC on plant biology, which was offered by Tel Aviv University in Coursera. The data mining was applied on a data set that documented the participants' actions during the course. Using cluster analysis, the course participants were classified into clusters, based on their activity in the main learning resources of the course. The different types of engagement and behaviours that emerged in the clusters were analyzed.

The studied MOOC

The course began on October 2013 and lasted 7 weeks. Each week, a different topic was covered via the course learning resources, which consisted of: professor announcements, reading recommendations, 50 short video lectures, around 40 interactive in-video questions, 7 discussion forums, 6 quizzes, and a final exam.

The video lectures were uploaded to the course website on a weekly basis, ranging from 5 to 9 new lectures per week. The participants could watch the videos online, and/or download them and watch them offline. The quizzes interspersed among the videos were presented in online mode only, and contained both open and close-ended questions, that were followed by feedback. Some of the questions contained hyperlinks to resources outside the course website, and some referred the students to the course discussion forums.

The discussion forums were arranged into 7 sub-forums according to topics, e.g. lectures, assignments, study groups. The participants were able to observe the discussions and participate by initiating new threads, adding posts, or commenting on their peers' posts. In addition, a voting mechanism allowed the participants to vote for posts in order to bring more attention to thoughtful and helpful posts.

The course assessments were based on weekly quizzes and a final exam. The quizzes consisted of 5 to 6 mostly close-ended questions. The participants were given 100 attempts to complete each quiz, and were required to submit each quiz within one week of its release, in order to receive credit for it (a Late Days mechanism allowed for late submissions without losing points). The quizzes remained accessible throughout the course, enabling the participants to use them for practice. The final exam was published during the last week of the course and consisted of close-ended questions. The exam due date was 2 weeks after its release, with a time limit of 3 hours to complete it. Participants who completed the course with a grade of at least 78% (comprised of 50% quizzes and 50% final exam) received a statement of accomplishment.

Participants

32,007 people registered for the course, and 68.4% of the registrants (21,889) started it. 10.6% of the participants who started the course (2,319) completed it and received a certificate.

Analysis

The data examined in this study was received from Coursera in database tables that contained over 1 million records of participants' actions during the course. Using MySQL queries, a set of variables were computed for each participant, displaying their use of the course components. A table was then created from these variables with 21,889 records (one record per participant who started the course), in order to perform a cluster analysis. Following a correlation test, 8 variables were chosen for the analysis: video variables: unique video lectures viewed online, unique video lectures downloaded, and unique in-video questions answered; discussion forum variables: total thread views, total threads opened, total comments; and

assessment variables: unique quizzes submitted, and final exam submitted. A Two-Step cluster analysis was applied separately for the NCEs and for the CE groups. This separation was essential in order to gain better insights into the different behaviours between the groups and within each group.

Findings

The clusters

The cluster analyses were applied in order to identify types of participants' behaviours during the course. The analyses revealed 8 clusters in total; 4 clusters per group. The average silhouette measure was 0.7 for the NCEs group analysis, and 0.6 for the CE group analysis. Table 1 presents the clusters and the average value of each cluster variable (for the variable called Exam Submitted, the mode is presented).

Table 1: The clusters found in the cluster analyses

	Non-Certificate Earners (N=19,570)				Certificate Earners (N=2,319)			
Cluster id	NCE-1	NCE-2	NCE-3	NCE-4	CE-1	CE-2	CE-3	CE-4
Cluster size	13,317 (68%)	1,935 (10%)	3,187 (16%)	1,131 (6%)	523 (23%)	1,461 (63%)	257 (11%)	78 (3%)
Unique videos downloaded	0.92	45.69	1.33	10.79	35.55	1.43	47.19	12.99
Unique videos viewed online	3.79	5.13	29.92	31.75	12.18	48.61	45.95	43.09
Unique video questions answered	2.12	2.60	21.43	20.71	4.21	33.54	32.21	29.67
Total thread views	0.75	1.32	4.34	21.59	19.58	24.74	34.10	271.18
Total threads opened	0.00	0.00	0.00	0.33	0.14	0.14	0.18	2.68
Total comments	0.04	0.03	0.19	1.28	0.34	0.75	0.75	18.72
Unique quizzes submitted	0.20	0.65	2.30	4.51	6.00	6.00	6.00	5.82
Exam Submitted	No (100%)	No (100%)	No (100%)	Yes (72.9%)	Yes (100%)	Yes (100%)	Yes (100%)	Yes (100%)

Types of engagement

The clusters obtained in the analyses were examined for the general level of engagement during the course, which was measured by overall activity in regard to learning resources. Five major types of engagement were identified. The first type appeared in cluster NCE-1, which characterized 13,317 participants with very low average values for all variables, which indicated very low activity in regard to all the main learning resources of the course. These participants barely experienced the course, and dropped out almost instantly; clearly, all of them were NCEs. They were thus named the Tasters. The second type of engagement emerged in cluster NCE-2, which was characterized by 1,935 NCEs who demonstrated, similarly to the first cluster, very low levels of engagement in all variables, except for an extensive downloading of video lectures. It is unknown whether they watched the videos offline or only stored them (perhaps for future use). They were thus named the Keepers.

A third type of engagement emerged in cluster NCE-3, which was characterized by 3,187 NCEs who demonstrated moderate activity in viewing the videos online and answering the in-video questions, and low activity in the forums and the assessments. They were named

the Partially Persisting. The fourth type of engagement appeared in cluster NCE-4, in which the participants demonstrated moderate to high average values in most of the variables. This cluster contained 1,131 participants who, on average, watched and downloaded a large portion of the videos, submitted a significant number of quizzes, and submitted the exam (most of them). Despite their high level of engagement during the course, they did not earn a statement of accomplishment. Therefore, they were named the Committed participants.

The fifth and last type of engagement during the course was apparent in clusters CE-1 to CE-4, which contained participants who used the videos and the assessments thoroughly, and used the forums in varied degrees. These clusters contained 2,319 participants, and all of them were CEs. They were named the Completers.

Video usage

The clusters resulting from the analyses were examined (excluding the first one due to negligible participation during the course) and three types of behaviours were identified in regard to the videos: watching the videos online, downloading the videos, and a combination of the two. The first type appeared in clusters NCE-3 and CE-2, and characterized 4,648 participants, from both the NCEs and the CEs groups, who viewed the videos mostly online. They were thus named the Onliners. The second type appeared in clusters NCE-2 and CE-1, and characterized 2,458 participants, from both the NCEs and the CEs groups, who mostly downloaded the videos. They were named the Offliners. The remaining clusters (NCE-4, CE-3 and CE-4) characterized the third type of video usage, which was a combination of viewing the videos online and downloading them. The total number of participants in these clusters was 1,466. They were named the Combiners.

Participation in the discussion forums

When analyzing the clusters (excluding the first one due to negligible participation during the course), two prominent types of behaviours in regard to the discussion forums were identified: passive participation and active participation. The first type was common in most clusters (NCE-2, NCE-3, CE-1, CE-2 and CE-3) and characterized 7,363 participants who mainly observed the forums to varied degrees, without taking an active part in the on-going discussions. The NCEs among them observed the forums very slightly, whereas the CEs observed them to a moderate degree. These participants were named the Observers. The second type of participation in the forums was much less common, and appeared in clusters NCE-4 and CE-4. These clusters contained 1,209 participants who, in addition to observing the forums, participated actively in the discussions. The NCEs among them observed the forums to a moderate degree and were active very slightly, whereas the CEs participated intensively both passively and actively. They were named the Active Participants.

Participation in the assessments

Three levels of participation in the assessments were identified in all clusters (excluding the first one due to negligible participation during the course): negligible, moderate, and, extensive. Cluster NCE-2 characterized 1,935 participants with negligible usage of the

assessments. Cluster NCE-3 characterized 3,187 participants with low usage of the quizzes, and no submission of the exam. These two clusters consisted of NCEs only (by definition). The remaining clusters (NCE-4, CE-1 to CE-4) characterized 3,450 participants who used the assessments extensively. It should be noted that some of them did not earn a certificate.

Table 2 summarizes the types of participants' behaviours that emerged in the analyses.

Table 2: Types of participants' behaviours

	Non-Certificate Earners (N=19,570)				Certificate Earners (N=2,319)			
Cluster id	NCE-1	NCE-2	NCE-3	NCE-4	CE-1	CE-2	CE-3	CE-4
Cluster size	13,317 (68%)	1,935 (10%)	3,187 (16%)	1,131 (6%)	523 (23%)	1,461 (63%)	257 (11%)	78 (3%)
Engagement	Tasters	Keepers	Moderately Persisting	Committed	Completers			
Videos		Offliners	Onliners	Combiners	Offliners	Onliners	Combiners	
Discussion forums		Slight Observers		Moderate Observers	Moderate Observers			Extensive Observers
				Slightly Active				Extensively Active
Assessments		Negligible	Moderate	Extensive	Extensive			

Discussion

Five major types of engagement during the course were identified, based on the participants' activity in regard to the main learning resources. Among the NCEs, a significant number of participants were Tasters, who barely experienced the course. However, with reference to criticism regarding relatively low completion rates in MOOCs, significant numbers of participants who demonstrated some level of engagement during the course were identified, ranging from the Moderately Persisting participants to the highly Committed participants, who used a large portion of the course resources. In addition, a group of NCEs, who expressed an interest in downloading a significant portion of the video lectures, was identified (the Keepers). It is unknown whether they watched the videos offline, or only stored them, perhaps intending to use them in the future.

Regarding video usage, three types of behaviours were identified: online, offline, and combined. These types may indicate different participant preferences for watching the videos, and may have significant implications on the learning process, as they facilitate different pedagogies. The Onliners may benefit from the scaffolding that exists online, such as the in-video quizzes that support Mastery Learning and Retrieval Learning. The Offliners, on the other hand, may benefit from the flexibility of watching the videos anywhere, also in cases where there is a lack of proper internet connectivity. It was found that the majority of the participants were Onliners. Interestingly, Offliners were found among the CEs group. These participants did not make an exhaustive use of the pedagogical affordances inherent in the online videos but still earned a certificate.

Regarding the discussion forums, two prominent types of participation were identified: passive and active. Consistent with the literature, the vast majority of discussion participants were found to be Observers, whereas only a small group, consisting mostly of CEs, held the

on-going discussions. One of the benefits of online learning, especially with great promise in MOOCs, is the possibility to be part of a large learning community. These findings raise questions regarding the extent to which the social learning potential of MOOCs is realized.

Finally, three levels of participation in the assessments were identified: negligible, moderate, and extensive. The CEs obviously used the assessments thoroughly. Among the NCEs who were engaged with the course to some extent, the quizzes were used in varied degrees, being more popular than the exam.

This study was conducted on one MOOC. More research is required on other MOOCs, in varied disciplines, target audiences, and structures. This study is part of a large-scale study which examines diverse aspects of participants' behaviours in MOOCs.

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AN APPROACH TO DIGITAL LEARNERS IN A CATALONIAN PUBLIC FACE-TO-FACE UNIVERSITY

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Introduction

According to Battro and Fischer (2012), education is being transformed by emerging technologies and new approaches to teaching, learning, and pedagogy. In higher education, institutions employ technologies to enhance learning, teaching and assessment activities, for example, use learning management systems (virtual learning environments) and web-based applications to deliver both the curriculum and student support. The growth in the use of Information and Communication Technologies (ICT), especially the Internet, is having a significant impact on society and on many aspects of daily life. The world that young people grow up in prior to their arrival at university is filled with new technology that is integral to the way they live, think, communicate, and the way they work (Jones & Healing 2010). According to Gabriel, Campbell, Wiebe, Macdonald and McAuley (2012), students arrive in colleges with different expectations, skills, and needs than those the traditional education system was designed to teach.

Some authors (Tapscott, 1998; Howe & Strauss, 1991; Prensky, 2001; Oblinger & Oblinger, 2005) have claim the existence of a new generation of students, who were born roughly between 1980 and 1994, and represent the first generations to grow up with this new technology, to have a more intuitive and deeper knowledge of ICT than previous generations. This generation was given several names that emphasize its affinity and tendency to use digital technology. According to Jones, Ramanau, Cross and Healing (2010) net generation, digital natives and Millennials are the most popular terms and “each way of describing this new group of students carries with it some distinct features but in general the terms are used interchangeably” (p.723). Whatever the terminology, the exposure to technology is a critical element in determining at least some of the characteristics attributed to these students (Gallardo-Echenique, Marqués-Molíás, Bullen & Strijbos, 2013).

The argument that there is a generation of learners with distinct skills and characteristics attributable to the exposure to digital technology had been accepted uncritically by many educators. The key claims of the “Net generation” discourse are not based on empirical research and seem to be inappropriate or insufficient to describe the population of current learners, because some key claims about this generation are still to be provided (Bullen,

Morgan & Qayyum, 2011; Gallardo-Echenique et al., 2013). This changed in 2007 as researchers began to take a more critical look at this issue questioning the validity of the generational assumption (Bennett, Maton & Kervin, 2008; Jones et al., 2010; Bullen, Morgan & Qayyum, 2011; Bullen, Morgan, Belfer & Qayyum, 2008; Bullen, Morgan, Romero, Sangrà & Guitert, 2012; Romero, Guitert, Sangrà & Bullen, 2013; Gallardo-Echenique, Marqués-Molíás & Bullen, 2015).

Given the lack of empirical support for the “Net generation” discourse, this study presents a different perspective of what learners think about their use of digital technologies for academic and social purposes and examines this issue in depth to gain an understanding of what the growing use of new digital technologies means for teaching and learning in higher education.

Aim and research questions

The central aim of the study is to understand how university learners use digital technologies and what are the implications of their use for Higher Education.

The study was guided by the following research questions:

- Do postsecondary students distinguish between their social and educational use of digital technologies?
- What impact does students’ social use of digital technologies have on postsecondary learning environments?
- What is the relationship between social and educational uses of digital technologies in postsecondary education?

Methodology

An interpretivist methodology was used to guide our research to emphasize interpretation and to focus on the meanings of the researcher and the participants (Bryman, 2004). In order to explore the research objectives fully, a mixture of both quantitative and qualitative research has to be undertaken (Creswell, 2009; Tashakkori & Teddlie, 2003).

This study used a sequential transformative mixed methods design, consisting of two distinct phases: in the first phase, the quantitative data is collected and analysed first to provide a general understanding of the research problem and to identify information about students’ communication and study habits. In the second phase, the qualitative data and its analysis refined and explained those statistical results by exploring the participants’ views regarding in more depth. In the study, the priority was given to the qualitative aspect of the study focused on in-depth explanations of the results obtained in both phases that were integrated during the discussion of the findings of the entire study (Hanson, Creswell, Plano Clark, Petska & Creswell, 2005).

Context

The research was conducted in the Faculty of Educational Sciences and Psychology of the Rovira i Virgili University (URV), a multi-campus system located in the cities of Tarragona, Tortosa and El Vendrell, Spain.

Population and Sampling

“Homogeneous” and “Convenience” samples were used; settings, groups and/or individuals are choosing based on similar or specific characteristics (Homogeneous) and are willing to participate in the study (Convenience) (Miles & Huberman, 1994; Collins, Onwuegbuzie & Jiao, 2006).

I Phase

First year university students of the Faculty of Educational Sciences and Psychology – of the degrees of Pedagogy, Social Education, Early Education and Primary Education in the 2012-2013 academic year. The sample consisted of 204 students.

II Phase

All the students of second-year – who previously participated in the I Phase – of the degrees of Pedagogy, Social education, Early education and Primary education (Campus Tarragona, El Vendrell and Tortosa), in the 2012-2013 academic year. The sample consisted of 40 students.

Instruments

In the first phase, the quantitative data was collected via an online questionnaire – adapted from a “Survey of Student Communication & Study Habits” that was developed by Bullen et al. (2008). The questionnaire was translated to Spanish by experts from the Open University of Catalonia (see Romero et al., 2013). The goal of this questionnaire was to understand how students interact with classmates and instructors outside of class. The survey uses a Likert-type scale of four choices (from “never” to “always”; “strongly disagree” to “strongly agree”) with 78 item questionnaire. This instrument was distributed by email and through the institutional learning management system from February to April 2012.

In the second phase, the instrument employed was developed by Bullen et al. (2008). The interview guide contained 13 open-ended questions about their use of ICT at the university and their overall perception about technology. The goal of this phase was to delve deeply into students’ use of digital technology for academic and social purposes, and to understand interviewees’ views on their situations, experiences and lives as expressed in their own words. Detailed information on content criteria validation about the survey and the interviews can be found at Romero et al. (2013).

Data Analysis Procedures

A descriptive statistical method and statistical software program (SPSS) were used to analyse, describe and present the quantitative data. The qualitative software Atlas.ti 7.1.7 was used to import the transcription of the interview and to code each response. Thematic analysis was employed to analyse the semi-structured interviews as outlined by Braun and Clarke (2006). Analysis was a highly iterative process involving successively reading, coding, reviewing, and re-coding the data into categories (Creswell, 2003; Fereday, 2006; Saldaña, 2009). This process uses inductive reasoning, by which categories and codes, supported by quotations, emerge from the data through the researcher's careful examination and constant comparison. Code names were assigned to those themes that were detected and then organized into categories (sub-categories) of related topics, patterns, concepts, and ideas that emerged from learners' perspectives.

Trustworthiness

Following Lincoln and Guba (1985), this study addressed quality in terms of trustworthiness: i) Credibility – prolonged engagement, triangulation (methods and data) and consultation with experts; ii) Transferability – thick description, providing rich detail of the context of the study; iii) Dependability – Cronbach's alpha coefficient (0.924), inter-coder agreement (98%) and codebook; and, iv) Confirmability – audit trail.

Finding and discussion

Due to space constraints, this paper focuses on present the most relevant findings and their discussion according the research questions.

RQ 1: Do postsecondary students distinguish between their social and educational use of digital technologies?

According to our findings all the students distinguish between their social and educational use of digital technologies (devices and software). This suggests that within an identified set of digital technologies, students were able to identify which was better suited to a given task. All students can distinguish social practices (e.g. Facebook) for academic purposes, choose technologies according to their need (social and/or academic purposes), and can see the affordances of technologies for various purposes (e.g. for entertainment, communication, interaction, etc.). For example, Facebook's integration into students' social practices, particularly in relation to different modes of access to Facebook (e.g. students use of Facebook's app on mobile on the go). In line with Barkhuus & Tashiro (2010), the students used the advantages that mobile access provides, especially in relation to relationships (peers, classmates, family, relatives); although it should be noted that we did not find any evidence of faculty and student communication through Facebook.

For academic purposes, it was found that learners (regardless of age) use the Internet as their primary source of information (e.g. Google) to find resources to support their studies. For social purposes, the findings showed that Internet helps students maintain close ties between

family and friends, both close and non-close, especially those too far away to visit in person on a regular basis (e.g. instant messaging, Skype, Facebook). The Internet, in its social role, acts as a means of communication (Neo & Skoric, 2009).

Learners are able to recognize what technology they can and cannot use given a specific context. The most illustrative example is student use of personal vs. institutional e-mail. All the students have a university's official communication e-mail address with professors and peers, but students are using URV e-mail more than any other digital technology option for communicating only with faculty in the advising experience when it comes to academic goals. According to Bullen, Morgan and Qayyum (2011), students used e-mail with professors in situations that demanded more formality, or where it was desirable to maintain a certain distance.

Also, all the respondents were capable to identify the benefits of digital technologies for academic and social purposes. The majority of students valued speed and the convenience of portability and function available in mobile devices (e.g. laptops, smartphones). New advances in technology is providing an opportunity for people to take their technology with them wherever they go (e.g. portable media players, smartphones, small laptops, tablets) could all be utilized to create, store, and access a wide range of digital information from a variety of locations.

RQ 2: What impact does students' social use of digital technologies have on postsecondary learning environments?

There is insufficient evidence to identify the actual impact of such technologies upon learning either in terms achievement or final academic results. Results from this study do demonstrate some impacts in their learning by improving the communication between them and peers. We could declare that some digital technologies impacted on the way they collaborate with their peers. The findings show that while learners are using some digital technologies for socializing, they are clearly being used in multiple spaces, including the formal contexts of the school setting. For example, Facebook is a social tool and our findings indicate that the students used it as a pedagogic tool for communication and interaction according to their needs via Facebook's group and discussion forum that facilitates participation and discussions. According to students' responses, Facebook is an important method of communication for the majority of students and they were sharing with their friends' class-related information. The participants also found their interactions with classmates via Facebook were important in helping them make sense of the subject matter, providing some homework help and support during classes and they also reported that these interactions extended their learning.

The findings show that the vast majority of students were using some particular digital technologies in their everyday lives, for their in-university and out-of-university contexts. We also found that increased familiarity with these technologies (e.g. Facebook, WhatsApp) positively impact into the developing of important social skills. Clearly both Facebook and WhatsApp are attractive, engaging interactive activities for most of the students. A possible reason could be that Facebook offers a variety of intrinsically interesting activities to perform

(e.g. posting status updates, view pictures and chatting with friends) that can all be performed within a single site (Wood, Zivcakova, Gentile, Archer, De Pasquale & Nosko, 2012). WhatsApp relies primarily on exchange messages without having to pay for SMS where students can create groups, send each other unlimited images, video and audio media messages.

Our findings evidence that the students spend some of their time with mobile SNS on Facebook and Facebook Chat. This is primarily due to the fact that many respondents were using software applications that more easily allow for real-time communication and sharing (course information, college notes). With the Facebook and Twitter applications available for their smartphones, it was easy for learners to check updates (Barkhuus & Tashiro, 2010). These results show that mobile technologies have had a positive impact on students' communication and data transfer reducing dependency on fixed locations for both social and academic activities, and thus have the potential to change the way students work and learn (Rapetti, Picco & Vannini, 2011). These findings indicate that somehow, mobile technologies are more flexible and enable students greater freedom of learning any place and any time.

RQ 3: What is the relationship between social and educational uses of digital technologies in postsecondary education?

At a general level there is a close relationship between social and educational use of some ICT. In theory, the social and academic lives remain as separate activity systems (Morgan & Bullen, 2009), however, our findings suggest that there is also a significant overlap in their use of some digital technologies (e.g. mobile phone, WhatsApp, Facebook) for academic and social purposes. For example, Facebook is a SNS that is mainly used for social interaction, especially to maintain existing relationship; however students were using Facebook for both academic (e.g. completing school assignments) and social purposes. This finding could suggest that the boundaries between formal and informal spaces are becoming blurred (Benfield, Ramanau & Sharpe, 2009; Clark, Logan, Luckin, Mee & Oliver, 2009).

Besides, students expressed a preference for the social networking platform over other the institutional course management systems (URV Moodle). One possible explanation of students' inclination to use Facebook is that "Moodle tends to be very focused and lacks the personal touch and networking capacity that SNSs offer" (Brady, Holcomb & Smith, 2010, p.152). With regard to communication, it is noticeable that students are not using the communication capabilities in Moodle, particularly advanced communication elements like forums, chats, blogs, and wikis. Most of students' communication is done in groups (Facebook and WhatsApp groups). Also, the findings suggest that while some students may feel comfortable with educational applications of Facebook and Twitter, few professors are ready to engage with them in such uses. To Hilton III & Plummer (2012), professors are reluctant to use it because some consider that an entry into Facebook world of their students may undermine their credibility as qualified professors.

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LEARNERS' BEHAVIOURS AND AUTONOMY IN LIVEMOCHA AND BUSUU ONLINE COMMUNITIES

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Introduction

Current Second Language (L2) learners have many different ways to come into contact with a wide range of voice applications, social networks, video-sharing websites, podcasts, wikis and blogs, and are more and more integrating the traditional bookish way of learning a language with the Web. Among the different online applications that arose with the social web, there are the so called “language learning communities” such as *Livemocha* (Livemocha.com) and *Busuu* (www.busuu.com). These communities are designed as common social network sites like *Facebook* (www.facebook.com) with the difference that they rely on learning content and material in the target language (TL) selected. In addition, they are designed in such a way so as to put into contact learners with native speakers from all over the world in order to exchange one’s native language with the TL. At the bases of these communities there is tandem language learning, which consists in a language partnership in which each learner is an expert of his/her interlocutor’s TL. These communities are untied to formal learning institutions, they are characterized by the absence of teachers (except for the presence of tutors in the case learners pay a fee) and the activities on the communities are structured with progressive didactic units and grammar exercises carried out consciously by learners. For all these reasons, they are a clear example of how formal, non-formal and informal spheres are intermingled. These environments designed for a potential language improvement and based on social networks raise some questions about the experience learners make in these communities. This paper, deriving from a broader study (PhD dissertation) about L2 language and social networking in *Livemocha* and *Busuu* online communities, focuses on the use that online users make of its tools and on the behaviours enacted when inhabiting the communities.

Literature review

This study, in general, is an extension and a contribution to the analysis of L2 practices using SNSs through the lens of the socio-cultural theory made by a considerable number of researchers (McCarty, 2009; Blattner & Fiori, 2009; Halvorsen, 2009) and that characterises the current research in the field. But it adds more insights to the field because it takes into account the perception of online learners who have been selected randomly in these online communities rather than in a classroom context. The literature about online communities for L2 learning can be divided into 3 main categories: descriptive studies, quantitative studies and qualitative studies.

Descriptive studies

The descriptive studies mainly provide a review of the main pedagogical features of *Livemocha* and *Busuu* online communities, in relation to the Web 2.0 and to the role of the user/learner within the community (Jee & Park, 2009; Pereira & Pinto, 2010; Liaw, 2011; Loiseau, Potolia & Zourou, 2011; Potolia, Loiseau & Zourou, 2011).

Quantitative studies

The quantitative studies (Stevenson & Liu, 2010; Brick, 2011; Lloyd, 2012; Chwo, Lin, Chen, Lai, Liu, Ho & Wang, 2012; Lin, 2012; Lopes & Coutinho, 2013; Liu, Evans, Horwitz, Lee, McCrory, Park & Parrish, 2013) mainly tend to insist on developing the pedagogical design of these communities according to the learners' needs. These studies in general found that these online communities provide some potential for language learning but that more research is required to improve the effectiveness of these environments under the pedagogical point of view according to specific long-term learning outcomes. The empirical research in this area leaves open questions about important aspects, such as the proportion of users who have actually completed the courses, the development and uptake of user-generated materials, and the relationship between language learning and social interactions within the community. Scholars in general, found correlations among participants' learning attitude, degree of satisfaction, visual design and functions of the website and underlined that it is necessary to explore these variables deeper.

Qualitative studies

The studies in this field often combined mixed methods but are mainly qualitative. They focus on students' perceptions of online communities for L2 learning (Harrison & Thomas, 2009; Lin, 2012), on affordances and constraints of the platform in relation to pedagogical issues (Clark & Gruba, 2010, Lin, 2012), on the role played by learner autonomy (Chotel & Mangenot, 2011; Chotel 2012), and on the thematic analysis of learners' interactive discourse (Chotel, 2012; Gonzales, 2012). The present studies show that these communities have a potential for learning but more research should insist on the analysis of affordances and constraints with the aim to improve them under a pedagogical point of view. Previous literature, also, insisted that it would be worthwhile to focus on aspects such as learner autonomy, online interactions, and learners' usage and goals over time by means of an ethnographic method. The dissertation aimed to cover these gaps. In the context of this paper, I will shed light on learner autonomy and learners' behaviours.

The socio-cultural framework

The big theoretical underpinning of this study is socio-cultural theory, according to which human mind is mediated (Lantolf, 2000; Lantolf & Thorne, 2006) and L2 learning is socially constructed through interaction. Vygotsky (1978; Wertsch, 1985) provides the basis for socio-cultural approaches to learning with an emphasis on the social construction of learning. According to the socio-cultural theory, social contexts are crucial to understand L2 learning

and personal, interpersonal and social factors have a strong influence on access to linguistic resources, interactional opportunities and L2 learning outcomes.

The Zone of Proximal Development (ZPD)

An important socio-cultural notion employed for this investigation is The Zone of Proximal Development (ZPD). In the field of language learning this is “the distance between the L2 learner’s developmental level as determined by independent language use, and the higher level of potential development as determined by how language is used in collaboration with a more capable interlocutor” (Ohta, 1995, p.96). The ZPD is basically the gap between what L2 learners can do by themselves and what they can do with assistance through collaborative interaction. Another notion related to the assistance in ZPD is “scaffolding” (Wood, Bruner & Ross, 1976; Rogoff & Gardner, 1984). It refers to the assistance provided to learners so that they are able to reach a higher level of performance. It is meaningful in the context of social networks because learners working together create a collaborative scaffold.

Activity Theory (AT)

The empirical work carried out is also guided by the conceptual framework of Activity Theory (Engeström, 1987). AT provided a theoretical framework and a valuable tool applicable to this study in order to gain a better understanding of the complex L2 learning practices enacted in the online communities, and in particular to understand learners’ actions taking into account each single learner in relationship and his interdependence with the social environment of the community. The adoption of AT as an underpinning framework permitted to explain the division of labour and the social roles and norms among learners while they are interacting in online communities. Finally, AT permitted to identify tensions and contradictions present in these online communities.

Objectives and research questions

This paper reports some of the objectives of the broader study. The objectives for this paper are:

- To learn about the dynamics generated within online communities designed for L2 learning, to discover what types of experience learners make of these communities and, accordingly, what kinds of behaviour they enact.
- To discover about learners’ autonomy in online communities for L2 learning. In particular, to examine the way in which the participants of these environments operate and construct their actions would allow me to discuss the extent of autonomy exhibited.

The research questions are the following:

- What are learners’ primary goals in these communities? How do different uses of the online communities and different patterns of behaviour contribute to different opportunities for L2 use?

- How (if) do learners take advantage of the conditions of self-learning that the uncontrolled learning environment of the social networks offers? What are their perceptions about it? Do they consider it as an opportunity for L2 use? How do they respond to these conditions of self-learning as autonomous learners?

The methodology

The methodology of this investigation relies on the interpretative paradigm, which, in line with AT and socio-cultural theory, holistically reconstructs isolated pieces of facts into a meaningful whole and which sees the world as complex, dynamic and socially constructed, interpreted and experienced by people in their interactions with each other and with the social systems (Schwandt, 1994). In fact, the analysis of the online community has taken into account the whole phenomenon as a complex system and the research focused on the complex interdependencies and dynamics developing within this system.

A multiple case study ethnographic approach

The study relies on online ethnography, which is considered as the most common approach to investigating online communities (Thomsen, Straubhaar & Bolyard, 1998). Through online ethnography I have studied the culture of the communities selected, the norms and rules determining learners' behaviour, their shared values and beliefs, their practices and their understanding of surrounding environment also when relating to others.

The methodology and its phases

A wide range of qualitative methods has been adopted, from the online survey and the semi-structured interviews to the collection of samples of interactive discourse occurring in online social networks. In this way, the methodological triangulation, that is, the use of different methods to corroborate each other, allowed the cross-checking of the data collected, improving further internal validity. The methodology adopted is funnel-shaped and it consists of 4 phases, as Figure 1 shows:

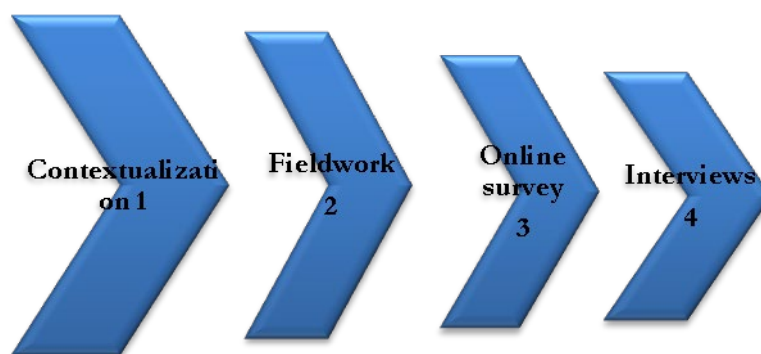


Figure 6. The 4 methodological phases of the investigation

Each phase opens up the way to the following phase and redirects to a deeper and deeper understanding of the behaviours enacted by informal learners in these communities, of the modalities in which peer assistance among them occurs, and of the different types of assistance they provide to each other.

- 1st phase: *Contextualization*. Review of the existing landscape of online communities for language learning and selection of *Busuu* and *Livemocha* communities as settings for the investigation.
- 2nd phase: *Fieldwork*. Immersion in the activities of the communities under analysis as a learner and observation of learners' behaviours.
- 3rd phase: *Online survey*. The objective of this phase is to identify trends, patterns of behaviours and main practices among language learners in the online communities.
- 4th phase: *Interviews*. This phase elicited learners' more detailed accounts of their experience and of their language use and learning in the communities through semi-structured interviews.

Results

Analysing the data, I identified different profiles of learners and different learning behaviours to which correspond different uses of the platform, a different level of engagement and attitude and different types of opportunities for L2 use. I distinguished among three broad categories of learners' profiles. To the i) first category belong those learners who make a wide use of the didactic tools, to the ii) second those who decided to opt for the social networking features of the community. These learners in part prefer the interactions in the online chat because these suit their personal learning style and in part because of the behaviourist and repetitive didactic tools of these platforms; to the iii) third those who combine the use of didactic tools with the social networking features of the community. Learners belonging to profiles 2 and 3 proved to be those who have more opportunities of exposure to the TL since they interacted in the chat.

The results also showed that learners are aware of the uncontrolled environment of social networks but they do not perceive it as "uncontrolled", since the self-paced lessons and the organization of the learning material tends to resemble the type of learning occurring in formal environments. It also emerged that many among them do not usually expect from the platforms more than they can actually offer. Therefore, they seem to respond to this condition by managing their own learning in such a way to use the platforms as a support and as a training tool. At the same time, many of them recognised that the platforms represent a valuable opportunity to practise the language with native speakers, which in a formal course is not always a common practice.

In addition, learners demonstrated to be highly aware of the limitations regarding the learning content of the platforms. According to learners' perceptions, it is in the area of content delivery and organization that the community needs meaningful development. Learners appreciate the self-paced lessons, the opportunity to learn at one's own rhythm and the

possibility to retrieve easily past lessons. Nevertheless, the repetition of the same typology of exercise is one of the main factors determining learners' abandonment of the platforms. One of the emerging themes is learners' management of their learning process within and outside of the community. Learners evaluate as very important the opportunity of learning more languages without any cost of money and time, since some of them underscored not to have money and time to attend face-to-face courses. Students in general seemed to recognise up to what level they could take advantage of the community's affordances and to have reflected on its limitations and constraints. In this sense, they took responsibility of their own learning and orientated their learning towards a more strategic learning.

Learners mainly demonstrated to recognize, be aware and appreciate the social networking aspect related to the platforms. However, some learners mentioned that they would like the platforms better organized visually and more user-friendly. To this regard, a student suggested adopting "more Facebook-like features" when looking for a language partner: About the social networking features, students' comments stressed the importance of belonging to the same community of learners and highlighted that they benefited the most when talking to native speakers of the target language.

To conclude, results revealed that those learners who showed a more autonomous attitude and were already lifelong learners when they joined the communities tended to have a more effective learning experience, to find interesting topics for discussion with their peers and to be able to combine social and pedagogical trajectories even if not adequately supported by a teacher.

Conclusion

Analysing *Livemocha* and *Busuu* online communities under the lens of AT, it was possible to identify *tensions* and *contradictions* within the activity system. These *contradictions* mainly concern its *tools*, the didactic materials and the social chat. The didactic materials consist of structural exercises belonging to the audio-lingual structural approach and they seem to be "in tension" and not to work in synergy with the idea of online community itself and with the social and communicative tools represented by the online chat.

In addition, given that these communities are inhabited by the three aforementioned categories of users, the actions of each subject in the communities are shaped by different motives and object. Therefore, when learners belonging to category 1 (who make an extensive use of the didactic units) come into contact with learners belonging to category 2 (who make an extensive use of the social networking features of the platform through the chat tool), their goals and motives are incompatibles and tensions emerge. In other words, learners adopt different behaviours because they are driven by different goals and the community, with its tools that do not work in synergy towards a common goal, contributes to emphasize these tensions.

This study makes a contribution to the achievement of a better understanding of the dynamics occurring in online communities and it added more insight to lifelong learning processes and on the current reflections on formal and informal learning contexts. It also provided some insights for teachers, tutors and practitioners but also for lifelong online L2 learners interested in integrating these learning practices with more traditional forms of learning. A limitation of this study concerns the presence of the researcher, who might have inevitably influenced the interviewees during the data collection process.

Future research should insist with the idea of “bridging activities” (Thorne & Reinhardt, 2008) between the communication occurring in out-of-class informal settings and the learning activities taking place in the formal context of the language classroom. To this regard, it would be useful, for instance, to apply AT to tele-collaboration initiatives on *Livemocha* and *Busuu* occurring in formal contexts. To conclude, another possible direction for further research would be about technical and usability issues in relation to these sites in order to determine which design features are most suitable and helpful to language learners.

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MOBILE TECHNOLOGIES AND CHANGING LEARNER CHARACTERISTICS AND PREFERENCES: TEACHERS' PERCEPTIONS

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Introduction

In the last fifteen years, one of the myths in the field of ICT research is the notion that the current generation are “digital natives” whereas older generations are “digital immigrants”. The terms “digital natives” and “digital immigrants” were coined by Prensky (2001a; 2001b) around the start of the millennium and consequently, different terms with similar meanings (e.g., Y generation, i-generation, Net-generation) have been used (for example, by Oblinger & Oblinger, 2005; Rosen, 2010; Tapscott, 2009) to characterise the younger generation of technology users. The idea of a whole generation are “digital natives” has been disputed by researchers on conceptual and empirical grounds (e.g., Bennet & Maton, 2010; Jones, 2012). For example, Bullen and colleagues (2011) developed an instrument to measure the learning characteristics of tertiary students. They found that there were little differences in terms of technology use by younger and older students in a Canadian higher education institution. Using the same instrument, similar results were found by Lai and Hong (2014) in New Zealand. While tertiary students in general had certain learning characteristics and preferences related to the use of digital technologies in the study, no significant generational differences were found between students of different ages. Most empirical studies to date that focus on learner characteristics have documented the learners’ own self-perceptions. It is therefore necessary to investigate whether university teachers’ perceptions of their students’ learning characteristics and preferences are similar. This is because teachers’ perceptions and understandings of learner characteristics have significant implications on their course design.

The study

In 2014, a study was conducted by the above authors at a research-intensive university in New Zealand aimed at investigating how university teachers utilised digital and mobile technologies in their teaching. One of the research questions guiding the study was:

What are the perceptions of university teachers on the learning characteristics and preferences of their students, as compared to 10 years ago, due to their use of mobile technologies and applications?

An online survey was emailed to all teaching staff (1,272) of this university. A total of 308 completed the questionnaire, with a response rate of 24%. Thirty of the questionnaire respondents took part in a follow-up interview lasting approximately thirty minutes. Demographic information on the questionnaire and interview participants is included in Table 1.

Table 1: Demographic information of the participants

	Male	Female	Professorial staff	Senior lecturer/lecturer	Professional Practice Fellow/Teaching Fellow
Questionnaire respondents	57%	43%	34%	48%	18%
Interviewees	53%	47%	23%	40%	37%

In the questionnaire survey, 108 respondents provided relevant responses to an open-ended question on whether, as well as how students had developed specific learning preferences through using mobile technologies. In the follow-up interviews the same question was asked to elicit examples and elaborations. All interviews were transcribed and coded, and themes were synthesised. Bullen et al.'s summary (2011) of the learning characteristics of "digital natives" (which are based on "digital natives" advocates' claims), were used to develop the coding scheme. Bullen et al. (2011) summarise the following characteristics of "digital natives": digitally literate, constant connection to the Internet and using it to access information; multitasking; a need for immediacy; prefer experiential learning, social and group work and are community minded; prefer structure in learning/goal oriented; and favour images over text.

Findings

The majority of university teachers perceived a change in the learning characteristics and/or preferences of their students over the last ten years, due to the students' usage of mobile devices. Of the 108 responses to the above open-ended question on the questionnaire, approximately three-quarters (76%) indicated they had observed changes in their students' learning characteristics and/or preferences, while 80% of the interviewees felt their students' learning characteristics and/or preferences have changed over the last ten years. These perceived changes are discussed in the following sub-sections.

The ubiquity of mobile technologies

Many participants commented on how the ubiquity of mobile technologies in contemporary society has affected the learning preferences of their students. For example:

Almost every student has a laptop, and they would open them up and do their work in class...so I think that's certainly a change because I think students, because of their use of social media and their familiarity with search tools and so on, and because they've got the devices with them all the time, they're able to contribute resources to the discussion. (I14).

Now I see that pretty much every second person has their laptop with them and the same I s'pose with phones starting to become sort of mini computers now. (I24).

Preference for online resources

With the ubiquity of mobile devices and the instant access to online resources they provide, participants saw their students as highly computer literate. Many discussed how students now have a preference for accessing online resources using their laptop or mobile devices rather than using the library or traditional resources, such as books, for research. For example, three interviewees mentioned how students could immediately access specific applications and/or websites on their mobile devices, which were vital to their course and future careers. These comments are typified by the following:

I think they use these mobile, portable handheld devices on an everyday basis if not every hour...they often record lectures, they often use applications to find music that I play in a lecture, they may use something like Sound Hound, which gives you the name of the song, the album or similar songs, they type things if they've got a slightly bigger device, they might, like an iPad or another similar device like that, they may type up notes during lectures, they can access my slides and just click on a link and it takes them to another resource. (I5)

I definitely know things are very different than they were you know back in 2002 when I first started as a teaching assistant, nowadays students ask us for you know podcasts, they ask us for you know lectures online, I mean a lot of other content that ten years ago they wouldn't ask us about it, I mean ten years ago they would ask us maybe about a handout, and now they want things online, and the making some of those resources available on mobile apps will probably you know mean that more students will access them. (I28)

Sixteen questionnaire respondents commented how their students preferred online information “they can access with their mobile devices” (S12) and students’ “preferences for easily accessible, well structured online resources” (S52).

A number of participants stated that with the increasing accessibility of information that digital and mobile technologies allow, the way students’ access information has changed. For instance:

That people tend to vary the way they learn, or the way they access information for instance, and the way they connect with different kinds of knowledge hubs if you like, so classroom becomes only one single or data point where learning occurs, there are other data points all over the place and of course mobile and ubiquitous technologies help people connect to their alternative knowledge repositories [and less] depending on the classroom and

the teacher, so that is a change...that there's a trend happening particularly the undergraduate students I would say. (I6)

Not attending lectures

Due to the convenience and ease of accessing information through mobile technologies, participants said that students “prefer to learn via electronic delivery rather than attending lectures and tutorials in person” (S32). Two lecturers commented:

They already have specific learning preferences as shown by wide student use of texting Facebook etc on laptops and phones during lecture delivery, rather than attending to the lecture material. There is some disconnect here – why should students bother to attend formal classes? (S18)

Being able to access learning material online or via a mobile app encourages students to not attend lectures, to the detriment of their learning. Such resources should be an adjunct to, not a replacement for formal learning. (S72)

In order to motivate students to attend lectures, interview participant I19 only put half the information his students needed for lectures online.

I've taken over a class from a younger colleague and she would put all the Powerpoints up, sort of even the day before the class is taught, whereas...now I am putting them up but I'm trying to do them in a strategic way, where it's not just giving them everything that they need it's actually giving them maybe half what they need and then they've got to come to class to get the other half...

Demand for immediacy

Numerous participants commented that students wanted information immediately since their mobile digital technologies could connect them with the Internet wherever and whenever they wanted. The word immediacy reoccurred across the survey and interview participants' responses. According to the participants, students demanded “immediacy of information transfer” (S34), “instant clarification of ideas and concepts” (S44), and that “content is available to them 24/7, and that you as the lecturer should be available to them 24/7” (S53). Two interview participants also commented that:

There's just more demand for things to be available online...out it on Moodle that's what they say...[they are] showing frustration with non-digital ways of doing things when there's a digital alternative, which is more engaging or more flexible or easier for them. (I18)

They want everything yesterday you know...[students] expecting that everything's there and it's available to them online all the time...and it gives them the false sense of security that they've got this you know, I've

downloaded it I've got it, but they haven't got it (laughs) all they've got is a file on their computer, they don't understand it, they haven't necessarily gone through it carefully and thought about it and they haven't you know been challenged on hard points. (I19)

Self-directed learning

Several participants commented that tertiary students have become more independent and self-directed learners with the use of digital and mobile technologies. For example students have developed, "personalized learning" (S11), and more "autonomy" in their learning (S3). Other survey participants made similar comments that with the advent of mobile digital technologies students have developed a desire for "more informal" (S84) and independent learning, "a preference for learning outside the classroom, on their own time" (S24) and "taking greater opportunities for independent and independently and diversely directed learning pathways" (S81). Two interview participants also stated that mobile digital technologies have allowed students to learn "on their own to try and find an answer for themselves" (I28). Interview participant I30 explained that:

I think the students have got more accomplished with self-directed learning, and they certainly know how to use media, they're certainly working a lot more now using resources that are picked up from the Internet than they did when I first started in 2000.

Surface and uncritical learners

A dominant theme that emerged from the interview and survey (33 out of 108) responses were that students have become surface learners and uncritical thinkers due to their use of mobile technologies, when compared to students ten years ago. Participants' comments indicate that students like to access online information on their mobile devices as it was "easily accessible" (S52), which in turn may discourage them "from using academic, peer reviewed, written information sources" (S50). Many questionnaire respondents discussed how information on the Internet was often "factual superficial" (S66) and not "authoritative or reliable" (S65). It also leads to "indiscriminate accessing of facts without filtering the information for validity or relative importance" (S138). According to some participants, students have thus become knowledge consumers and uncritical thinkers, as commented by I15,

Students seem to be less able to engage in a deep level of learning, somebody from the Law department recently was talking about how they've essentially dumbed down their questions over the years you know...but how much is due to engaging in a digital level, having everything accessible online and [I] don't know.

Many participants also said students are often unable to filter creditable and factual information on the Internet from inaccurate information. These comments are typified by the following:

From observation, some (many?) students seem to compile a lot of information electronically, mostly through uncritical copying and pasting, without actually working through the material and gaining an in-depth understanding. In these cases, computers etc. seem to be a counter-productive medium. (S108)

Obtain immediate answers and perhaps not seek further information to see if there are different opinions. (S35)

They are less likely to remember "facts" and other things that can be looked up easily (S37)

Preferring smaller pieces of information

According to some participants, students preferred to access small chunks of information on their mobile devices. For instance:

There's some anecdotal evidence floating around that there's sort of like multi-screening, all the multi-screening sort of activity that's going on is doing is just dividing attention up into smaller and smaller quanta of attention and small quanta of attention can really only support surface learning it doesn't really support deep learning umm, so I think it the there's definitely some behavioural changes there they've they have a preference for using those sorts of mobile devices to communicate and socialise (I9).

Rather than "preference" perhaps a "disposition" to consuming bite-sized portions of information uncritically, and an attendant lack of willingness/capacity to persevere with material that initially seems difficult/uninteresting/irrelevant (S4).

One participant commented that accessing small chunks of information on mobile devices fosters:

Short attention spans and inability to read text in their entirety, from beginning to end. This in turn makes leaning about acquiring information rather than gaining insight, knowledge or developing a style and perspective. (S120)

Multitasking

Several participants commented that students in contemporary society have developed a preference for multi-tasking, and as a direct result they cannot concentrate to the same degree as students ten years ago.

I've noticed a huge difference in that...most of them have laptops that they bring into class, I am concerned that they can also be barriers to discussion, so I've noticed that yes there's greater use of those but also there also seems to be less umm willingness to put down the lids and engage in a good discussion. (I1)

They're much more focused on being wirelessly connected or connected to a global world through mobile devices, whether that's their phones or their laptop and you can see that in classes where you wander around and they're all on Facebook or something you know, or text messaging when you're lecturing and things, which I can never figure out whether it's a compliment or annoying that they do it ... mobile devices are so a part of their lives that they wouldn't know how to function without them up to a point. (I6)

They've got probably more than one device around them anyway and they're checking on those various devices...there's more opportunity for distraction...the kind of ability to stay focused... (I12)

Experiential learning

"Digital natives" advocates contend that students immersed in digital and mobile technologies prefer to learn by partaking in active activities, rather than by passively listening to lectures and reading course materials (Thompson, 2013). In this study, no evidence was found to support this claim. A marine science lecturer commented on how her students learned from using mobile technologies:

[In] our lab sessions and we'll find the students looking up the answers on their phone, they won't actually be looking at the specimen in front of them, they'll go well here's the question, oh yeah Google...they'd much rather look up the answer rather than experience it themselves, we're becoming a step removed from the actually process of doing the learning...I think our students are becoming much more Google smart than they are hands on active learners...and there's the whole reading writing thing and going to libraries, it's just not happening anymore. (I16)

Contrary to claims made by "digital natives" advocates, some teachers considered that using digital and mobile devices may remove learning from concrete reality. For example, a clinical lecturer commented:

In my course we are teach clinical skills as it is a professional course. Already, some students would prefer to hide behind simulations than engage in the real situation. (S114)

Collaborative and visual learning

There was some evidence to suggest that due to their use of mobile technologies, students now preferred “group learning and discussion as opposed to learning in isolation” (S110). Students also now use Web 2.0 technologies to organise group activities and study groups, as pointed out by interviewee I15.

The other day I was putting my students in my 200-level-class into groups, and they were all saying right we'll make a Facebook group you know and they all organize everything via Facebook...that's how they organize their group activities, that's how they engage with their world digitally.

As for visual learning, there was little evidence to support the claim that students prefer images to text. Only one participant (S89) commented on this “I think they may become more critical about time-relevance, prefer interactivity, prefer graphic material and Multimedia”.

Changing pedagogy

The changes in learner characteristics and preferences, led some teaching staff to change their pedagogies. For instance, survey participant 86 stated that his department has changed the way teaching is delivered because of their students' high usage of mobile and digital technology.

We have studied the use of mobile technologies for learning in our programme, and 50% use it regularly. It promotes accessibility, flexibility and applying learning to work situations. Learning this has required us to change how we teach – smaller packets of information, presentation etc

Discussion and conclusion

Teachers' responses in this study highlight how tertiary students do possess some learner characteristics associated with the concept of “digital natives”. For example, the majority of teaching staff considered their students highly computer literate however, only in regard to their ability to access online information. Teachers also stated that students also want access to fast information and demand immediate feedback. There was some evidence to suggest that students engaged in multitasking, but little to indicate that students preferred images to text. There was some, although not strong evidence that students preferred collaborative group learning and little evidence to support the notion that students prefer active learning. It is clear however, that teachers considered the current generation of students as preferring to access small chunks of information on their mobile devices, which the participants considered a factor in making students surface and uncritical learners.

While this study contributes evidence on the changing learning characteristics of university students as a result of their use of mobile technologies, as perceived by their teachers, there are some limitations in this study. Firstly, while the questionnaire sample was relatively large, participants came from one university. Secondly, data gathered in this study were self-reports, which were inevitably affected by the participants' backgrounds, their differing experiences and own usage of mobile technologies, which have not been analysed in this paper. More research is needed on how teachers' own thoughts on mobile technologies impact on their own teaching practice and thoughts on their students' usage of mobile digital technologies.

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FLIPPED LEARNING: THE GATEWAY TO LEARNER AUTONOMY

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Abstract

Over the last two decades, the concepts of learner autonomy and independence have gained momentum. This shift of responsibility from instructors to learners is the result of a concatenation of changes to the curriculum itself towards a more learner-centred kind of learning. Moreover, this reshaping, of instructor and learner roles has been conducive to a radical change in the age-old distribution of power and authority that used to plague the traditional classroom. (Little, 1991, p.4), learners, autonomous, learners that is, are expected to assume greater responsibility for, and take charge of, their own learning. Recent advances in pedagogy and educational technology have pointed to the need to rethink the traditional in-class, lecture-based course model, and unlocked entirely new directions for more models that boost the autonomous learner. Flipped learning is one of those Models, It is a new pedagogical method which utilizes asynchronous video lectures and practice problems as homework, and push all online for learners to learn on their own while class time is dedicated to engaging learners in learner-centred learning activities like problem-based learning, exercises, and inquiry-oriented strategies. In Hamdan Bin Mohammed Smart University (HBMSU), we applied the flipped learning by integrated it with our blended learning model; therefore, we pushed all online lectures to self-paced online videos and used class time to engage learners in active learning exercises. This paper addresses Hamdan Bin Mohammed Smart University' Flipped Learning model, by illustrating the model anatomy and how it boosts the learners' autonomy and encourages a learner-centric environment; intending to serve as a guide to instructors to develop, implement, coach/monitor, and evaluate innovative and practical strategies to transform learners' learning experience. It also provides a comprehensive survey of flipped learning implementation; include: the type of in-class and out-of-class activities, the measures used to evaluate the model including, but not limited to increase learner participation, learner autonomy, engagement and motivation; improve learners' critical thinking/creative problem solving, improve learners' team-based skills and peer-to-peer interaction; make learners the centre of learning / encourage learners' ownership of learning; encourage faculty collaboration, and improve learning outcomes.

Blended Learning Model at HBMSU

Blended Learning Model at HBMSU HBMSU adopted a blended learning approach to combine the online delivery of educational content with the best features of classroom interaction and live instruction to personalize learning, allow thoughtful reflection, and differentiate instruction from learner to learner across a diverse group of learners. HBMSU has a unique blended learning model that integrates three major components: physical classes, synchronous online sessions, and self-paced learning. 20% is physical classes, 47% is synchronous sessions, and approximately 33% of the time is for self-paced learning. All the three components are equally important in enhancing learners' thinking, attitudes, skills, and knowledge.

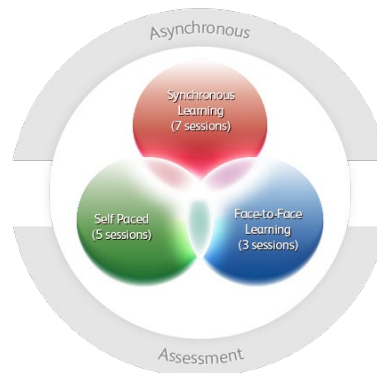


Figure 7. HBMSU Blended Learning Model

Integrating Flipped Learning with the Blended Model at HBMSU

What is Flipped Learning?

Flipped learning is a pedagogical model in which the typical lecture and homework elements of a course are reversed. Short video lectures are viewed by learners at home before the class session, while in-class time is devoted to exercises, projects, or discussions.

Learners gain necessary knowledge before class, instructors guide learners in actively and interactively clarifying and applying that knowledge during class, and class time could be used for expanding upon the content through collaborative learning and mastery concept exercises.

What's different about flipped learning?

Table 1: The differences about flipped learning

	OLD (Before the Flip)	NEW (After the Flip)
Before Class	Learners assigned something to read	Learners guided through learning module that asks and collects questions.
	Instructor prepares lecture.	Instructor prepares learning opportunities.
Beginning of Class	Learners have limited information about what to expect.	Learners have specific questions in mind to guide their learning
	Instructor makes general assumption about what is helpful.	Instructor can anticipate where learners need the most help.
During Class	Learners try to follow along.	Learners practice performing the skills they are expected to learn.
	Instructor tries to get through all the material.	Instructor guides the process with feedback and mini-lectures.
After Class	Learners attempt the homework, usually with delayed feedback.	Learners continue applying their knowledge skills after clarification and feedback.
	Instructor grades past work.	Instructor posts any additional explanations and resources as necessary and grades higher quality work.
Office Hours	Learners want confirmation about what to study.	Learners are equipped to seek help where they know they need it.
	Instructor often repeats what was in lecture.	Instructor continues guiding learners toward deeper understanding.

The Flipped Learning Implementation Process at HBMSU

Was initiated by the Learning Innovations and Strategies Office as a response to HBMSU's call for an enhanced learner-centred landscape for blended learning. The technologically sound flipped learning approach in education delivery was combined with adept teaching and learning practices against a pedagogical framework to help position HBMSU as the pioneer of this approach, and to assess its effectiveness in the university context. Thus, the following model is proposed.

The Model

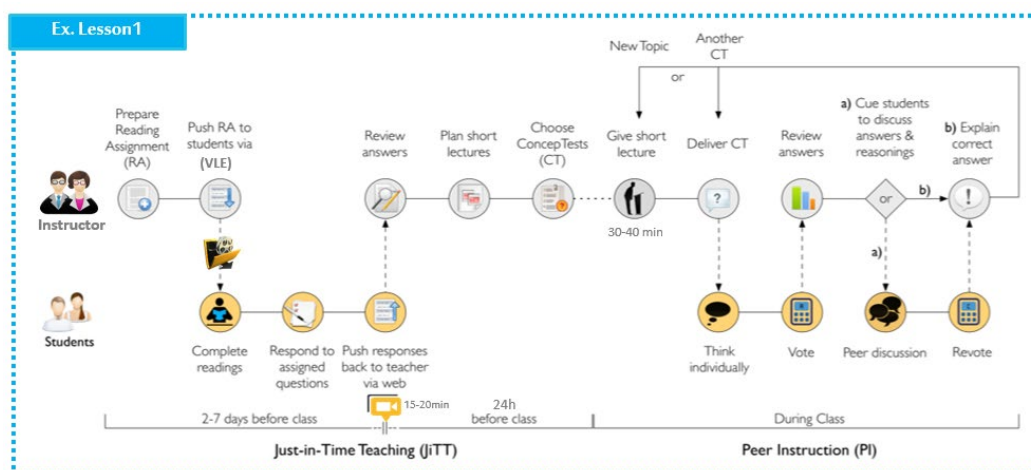


Figure 2. Flipped Learning Model

The Implementation Steps

1. Defining of content scope, learning objectives, and instructional strategies:
 - What is the scope of your topic?
 - How will learners use or apply the material?
 - How will learners meet the learning objectives?
 - Which instructional approach that will fit best for the main learning activity?
 - How will you contextualize the topic?
2. Learners gain familiarity with new material before class:
 - What instructional materials and resources will you use for learners to familiarize themselves with the content prior to class?
 - Plan and prepare the new instructional materials that learners will engage with prior to class.
 - What is the best way to communicate and present the new instructional material (e.g., video, text, animation, simulation, online multimedia module, or other)?
3. Activities that motivate learners to prepare before class
 - What kinds of activities will motivate learners and prepare them for class?
Refer to the learning objectives and tasks that you outlined in Step 1.
 - What incentives or motivations will learners have to prepare for class.

Here are some examples of ways to motivate learners to do the pre-class work. Ask learners to:

- Respond to open-ended questions online about the instructional material before class;
- Prepare questions about the instructional materials;
- Prepare a presentation about the topic;
- Attempt to solve some problems;
- Research examples that illustrate a principle and bring these to class.

Here's what you need to ensure in the flipped class.

Table 2: Before-Class Checklist

<input type="checkbox"/>	Learning objectives are SMART
<input type="checkbox"/>	Learning plan includes resources to be used before, during and after class
<input type="checkbox"/>	Adopt strategies that are learner-centric and focus on honing higher order thinking skills
<input type="checkbox"/>	Use learning resources that are diverse, and interactive exploit technology
<input type="checkbox"/>	Logically sequence and contextualize content to support learning
<input type="checkbox"/>	Incorporate audio in PowerPoint presentations to humanize content delivery
<input type="checkbox"/>	Engage learners in coverage activities before they come to class
<input type="checkbox"/>	Record reflections and provide constructive feedback for self-assessment activities

Plan for Week 1

Learning objectives (What I want learners to learn by the end of this week? This includes objectives written for before, during and after class.)	Choose an item		
Content coverage (What are the topics/concepts that will be covered to meet the learning objectives?)	Brainstorming Case study Concept maps Crossword puzzle Debate Digital presentation by learners (Individual/Group) Fishbowl discussion Group discussion using breakout rooms Index card writing		
Instructional strategy (How can I best deliver this content?)	Choose an item		
Digital content (What are the types of resources that will be utilized for the provision of knowledge before class?)	Choose an item		
Activities (What are the activities learners will do to demonstrate mastery of concepts covered in the week?)	Before-class activities (Self-assessment activities) Choose an item	Others, please specify Choose an item	Choose an item

Plan for Week 1

Learning objectives (What I want learners to learn by the end of this week? This includes objectives written for before, during and after class.)			
Content coverage (What are the topics/concepts that will be covered to meet the learning objectives?)			
Instructional strategy (How can I best deliver this content?)	Choose an item		
Digital content (What are the types of resources that will be utilized for the provision of knowledge before class?)	Choose an item		
Activities (What are the activities learners will do to demonstrate mastery of concepts covered in the week?)	Before-class activities (Self-assessment activities) Choose an item	In-class activities (Guided practice activities) Choose an item	After-class activities (After-class activity) Choose an item Assignment Essay Portfolio building Project Others, please specify

Figure 3. Template of flipped learning weekly plan

4. In-class activities that provide learners opportunities to deepen understanding:

- What kind of in-class activities will focus learners on attaining higher-level cognitive abilities?
- Refer to the learning objectives and tasks that you outlined in Step 1.
- Plan, prepare, and develop in-class activities that focus on higher level cognitive activities.
- Will learners be working individually in the classroom as you walk around and provide help, or will you solve problems together as a group?
- Create a brief introduction and explanation of this new process (Flipped). Many learners may not have any previous experience with a flipped learning and/or active learning.
- Explain how the new instructional material fits into the overall existing course structure.

Table 3: In-class Checklist

<input type="checkbox"/>	Adopt active learning techniques to create rich learning experiences
<input type="checkbox"/>	Monitor and guide team formation, brainstorming sessions, and all other collaborative activities
<input type="checkbox"/>	Focus on closing the gap between current and desired performance in individual and group activities
<input type="checkbox"/>	Prepare learners for the summative assessment

5. Post-Class activities that extend Learner learning:

- How will learners continue the learning experience from the in-class activity to outside of class?
Refer to the learning objectives and tasks that you outlined in step 1.
- Plan, prepare and develop the continuation of the learning experience from the in-class activity to outside-of-class individual or collaborative practice.
- Determine what learners should do after the in-class activity to continue learning/bridge to next topic.
- Think about and plan how often learners will need to practice or revise their thinking to really master the material and be successful.

Table 4: Post- Class Checklist

<input type="checkbox"/>	Establish criteria and standards for all assessments
<input type="checkbox"/>	Grade all assessments
<input type="checkbox"/>	Allow learners to complete evaluation

6. Ongoing evaluation & Assessment (summative & formative assessment)

- Plan for ongoing formative and summative ways to assess learner understanding and mastery.
Could learners attain all the learning objectives? What does mastery or success look like?
- Based on previous iterations of the course/lesson, did your learners' learning improve as a result of the new model?

Evaluation

- Plan for opportunities to evaluate by reflecting on the design of the class or course.
- Did you communicate the ideas effectively? Did you provide enough opportunities for learners to practice? Was it challenging enough? Ask for feedback from learners on what worked well and what didn't – and update your practices accordingly.

Flipped learning is fostering learner autonomy

Unlike the traditional classroom model, flipped learning puts learners in charge of their own learning; by providing lectures online, educators give learners the opportunity to learn at their own pace. Once a learner masters a concept, he can move on. Also, learners who need more time to master a concept won't get left behind. This means all learners are not working in the same area at the same time in and out of the classroom. In the flipped learning environment, the instructor becomes a guide off to the side, acting more as a facilitator, helping and guiding small groups and individuals toward learning success.

Table 5: Instructional strategies to promote autonomous learning

Transfers ownership of learning to the learners	Think-pair-share
Personalizes learning for learners	Inquiry/Discovery learning
Active learning strategies that increase learner engagement in-class time	Learning Stations
Group work	Cooperative learning
Differentiated learning	Guided reciprocal peer questioning
Hands-on activities	Problem-based learning

Evaluation of the Flipped Learning Model at HBMSU

A survey was conducted to assess the effectiveness of the model in terms of stakeholder satisfaction. The results are as follows:



Figure 4. Learners' Satisfaction

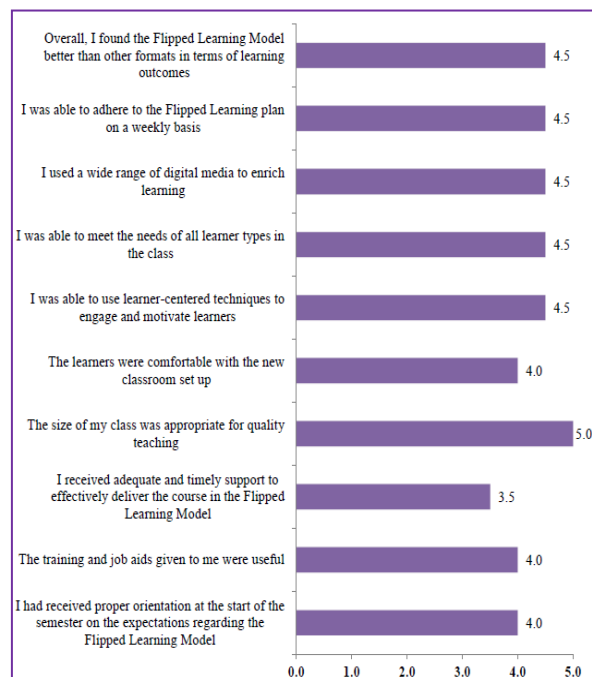


Figure 5. Instructors' Satisfaction

Main Conclusions from learners' and instructors' responses

- Results of the survey addressed to learners and instructors: the mean values (all > 3.5) indicate positive responses to the statements. Interestingly, there is a comment suggesting that the learners want “more flipped classes and less number of physical classes”.
- The model led to critical thinking, promoted autonomous learning, and facilitated active interactions among learners. The respondents agreed that the model took the course from instructor-centred, passive learner model to independent learning, learner-centred, empowering model. See Figure 4, 5.

Conclusion

Conclusion This paper has presented the flipped learning experiment at Hamdan Bin Mohammed Smart University (HBMSU) from the perspective of using effective pedagogical model, to foster learner autonomy and engagement, with particular attention to activities that generate autonomous learner. It presented practical strategies for effective implementation that reinforces the sense that the flipping technique is useful when seeking to optimize class time, support the development of higher-order thinking skills, and enhance instructor-learner and learner peer-to-peer interactions. It showed that this model can help to promote learner autonomy, as it helps learners to be more responsible and take ownership of their learning process. The evaluation of this model showed that the success of a flipped approach hinges on the synergy between instructor and learners and requires sustained motivation and contribution before, during, and after live instruction. When used appropriately, classroom flipping is a valuable addition to higher education practice.

“Once you engage the Learners’ minds, there’s an eagerness to learn, to be right, to master.” (Erik Mazur, Harvard Professor)

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EMPOWERING STUDENTS BY CO-DESIGNING EXPANDED LEARNING SCENARIOS

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Introduction

Learner-centred environments and instruction involve the application of a variety of methods that place students and their learning activity at the centre of the teaching and learning process. This may materialise in different ways, but some common characteristics would be that learners are usually confronted with an authentic, ill-structured and contextualized task, in order to induce relevant learning experiences, as occurs for example with inquiry-based learning models. For many years researchers have been calling for a transition from teacher to student-centred environments and instruction. However, many features of teacher-centred models still remain in higher education practices. There are different perspectives that explain the tension between teacher-centred and student-centred models (Elen, Clarebout, Léonard & Lowyck, 2007). In this paper we sustain the transactional view, according to which teachers and students are jointly responsible for the success of the learning process. This means that teachers and students negotiate and decide together the tasks and roles that each one will assume in the process and, thereby, each other's level of control over the learning process. Among other things, this may depend on the students' capabilities and willingness to regulate their own process, as well as on their level of domain-specific prior knowledge. From this perspective, teachers continuously reassess and coach the gradual growth of students' responsibilities and reorient their own tasks and role accordingly (Elen et al, 2007).

A critical factor for the adoption of this kind of student-centred transactional model is the students' capacity and readiness to self-regulate their learning process. On the other hand, many studies prove that student engagement constitutes an essential means for generating positive learning experiences in higher education (Paulsen & Feldman, 2005). Deci and Ryan's "self-determination theory" proposes social and environmental factors that facilitate intrinsic motivation. According to this theory: "social contextual conditions that support one's feelings of competence, autonomy, and relatedness are the basis for one maintaining intrinsic motivation and becoming more self-determined with respect to extrinsic motivation" (Ryan & Deci, 2000, pp.68).

Our research is based on the assumption that empowering students to feel more autonomous, competent and connected with their teachers and peers may result in greater involvement in their learning processes, and in turn this may have a positive impact on the adoption of a student-centred transactional model. We sustain that student empowerment may require

intervening in different directions, some of the more fundamental ones could be stated as follows: i) improving students' knowledge and expertise with the learning methodology; ii) proposing a rich, compelling and authentic learning scenario and tasks, providing opportunities for active learning; iii) promoting interchange and negotiation between students and teachers regarding their respective tasks and responsibilities throughout the learning process.

The Design2Learn project intends to involve students in the co-design of learning scenarios that are inquiry-based and expanded by technology. In this paper we focus on the potential of empowering the student voice through student involvement in the joint process of designing learning scenarios with teachers and researchers. We believe that these participatory design practices may also increase students' engagement and facilitate the adoption of student-centred and expanded learning scenarios.

In the following sections we refer to the foundations of co-design as a means of empowering students by integrating their voice into the design of expanded learning environments. Next, we present the D2L research framework and purpose, as well as the research questions dealt with in this paper. Finally, we discuss the opportunities and pitfalls observed so far in the experiences of students co-designing expanded learning scenarios.

Theoretical background

Students' empowerment and learning co-design

The learning process in current online and face-to-face educational scenarios commonly requires students to understand meanings and learning tasks proposed by the teacher. This asymmetric relationship between the teacher and students makes the latter strongly dependent on the former and turns the learner into a passive receptacle of content. However, there are other more knowledge-based approaches in which the learners' role changes considerably by making them more responsible for their own learning while the teacher occupies a co-learner position, which has been shown to be academically effective and personally satisfying (Houser & Frymier, 2009). These approaches rely on empowering learners through engagement and enabling them to develop their capacities and achieve their potential. Empowerment gives students the role of meaning-maker by allowing them to take the initiative in their learning, something that is crucial in a co-design perspective. There is evidence showing that PBL-oriented tasks – under the IBL umbrella – promote more empowerment and learning engagement than conventional lecture learning (Siu, Laschinger & Vingilis, 2005).

The empowerment paradigm is nourished by different theories such as self-directed learning (Knowles, 1984), self-regulated learning (Zimmerman, 1990; Azevedo, 2005) and also the self-determination theory (Deci & Ryan, 1985). All these theories tackle aspects that are directly related with students' inclusion in the process of designing their learning with their peers and the teacher which are: learner self-concept, learner experiences and perceptions, readiness to learn, metacognition, motivation, orientation towards learning, etc. (Brooks & Young, 2011).

It is possible to find numerous recommendations on how to promote empowerment in learning but most of the proposals and studies only consider the teachers point of view or involve occasional student feedback on assignments or tasks (Klopfenstein, 2003) or student satisfaction surveys. Although all primary empowerment factors are connected with the students' perspective and characteristics (meaningfulness, competence, impact and choice (Thomas & Velthouse, 1990) it is difficult to find learning design studies that involve students negotiating with teachers or educational designers about the learning approach of the instructional process, which could presumably be one of the most effective strategies for engaging and including learners' perspectives in the online educational setting.

Although the idea of student participation in curriculum design is not new and has been developed mainly in primary and secondary education, especially in the USA (Rudduck & Fielding, 2006), it continues to have a very modest and partial scope in the field of higher education. The latest pedagogical literature provides arguments in favour of the idea of actively involving students in curriculum design, either from the perspective of enhancing the development of their critical judgment, increasing their commitment and responsibility for their own learning, enabling more authentic and meaningful learning experiences, improving the options to personalize learning, or understanding the very idea of curriculum as a co-creation task between teachers and students (Bovill, Morss & Bulley, 2009). However, although there is a clear stream of research that supports the need to address learning in universities from the shared responsibility of teachers and students, examples of transformation in concrete contexts of practice are almost anecdotal and confined to specific projects, and there is still little systematic evaluation of their real impact and specific dynamics (Bovill, Cook-Sather & Felten, 2011).

From student-centred to expanded learning scenarios

Student-centred education obviously promotes better adaptation to the students' learning needs and expectations. One way of putting the student into the centre of the learning process is to implement methodologies that imply the students' involvement and engagement by letting them take decisions and orientate their learning process. In this sense, when proposing inquiry-based methodologies we place students actively into the centre because they are the protagonists of the activity, constructing and regulating their learning. Literature in the IBL domain has led us to identify several principles that an inquiry process must meet. We have applied these aspects as referential design principles when co-designing the learning scenarios:

1. the learning process is based on inquiry (the student has to investigate by contrasting new ideas with prior knowledge and experiences),
2. learning is orientated by problem solving,
3. the sequence of learning tasks is based on the scientific method (understand the problem, search for information regarding the problem, formulate questions, collect and analyse data, contrast hypotheses and answer the questions),

4. the learning activity is focused on the students and directed by them (students are the protagonists of the activity, they construct and regulate their learning),
5. teaching is approached in an inductive manner (not by giving lectures), and
6. the teacher supports and scaffolds the learner activity when and where necessary.

Based on the idea that learning does not occur just when teacher consider and trying to accompany students when and where they need it, has grown the notion of expanded learning opportunities (ELOs). The basis of ELOs is that learning may occur anytime and anywhere, which implies to rethink when, where and how education occurs. This approach considers that formal education is not the unique way of teaching, understanding that students can learn continuously inside or outside of the education institution, from not just teachers and without time constraints. In this sense, the use of technologies has increased the concept of “expanded” by incrementing the notion of “time to learn”, “places where to learn”, “ways of learning” and incorporating a wider community “from whom to learn”.

Literature regarding the future trends in technology-enhanced and expanded learning – TEEL – (Andrews et al. 2011; Davidson & Goldberg, 2010; Johnson et al., 2015; Luckin et al., 2010; Redecker et al., 2011; Redecker et al., 2010; Sharples et al., 2014; Traxler, 2011; van der Woert, 2014) emphasizes the following principles, which we have also adopted as a design principles in the co-designing process of learning scenarios:

- Learning is participatory and social: technology facilitates the horizontal relationship between the teacher and the students. Students are networked and participate in various communities. In this regard, technology can offer a social and networked learning environment that facilitates interaction between students, mutual support and knowledge sharing.
- Learning is ubiquitous, it takes place anywhere and anytime. Giving students a central role involves considering and taking advantage of the multiple contexts and times when their learning occurs. It is important to connect formal and informal learning, to create synergies between the two learning experiences and the spaces and resources involved. In this sense, technology encourages mobility and access to knowledge transversely and contextualized in real experiences, shaped by multiple devices and learning spaces, whether formal or informal.
- Learning involves open practices: technology promotes the use of open educational resources, reusing what others have already created and even improving or creating new resources, disseminating and making them available to the educational community. Technology enables teachers and students to access these resources, consult, use, edit and share, as well as create new ones and post them.
- Learning is personalized and self-directed: it has to do with providing students with everything necessary to meet their needs and preferences and also adapting to their skills. Technology may allow students to set and adjust their own learning environment according to their needs, rhythms and learning styles and encourage self-learning and lifelong learning.

Incorporating students into processes of co-designing learning scenarios may promote the integration of new perspectives, consistent with stated IBL and TEL design principles, which may help to change teaching practices to better suit students' way of learning.

Methodological design

The specific research questions raised by this study have been formulated as follows:

- Is co-design an effective approach for empowering students' voice and promoting student engagement?
- Can the student voice approach bring relevant contributions to the design of expanded learning environments?

Research framework

The study applies the methodology of design-based research (Design Based Research Collective, 2003). The object of study is therefore the very process of co-designing involving teachers, students and researchers, taking as key agents both the teachers and the students to whom those practices are addressed. A mainly qualitative approach is used for data collection, analysis and interpretation although quantitative measures have been used for specific results.

The participants in the research are a group of six teachers and 11 students from two universities with different models, one of them blended (University of Barcelona) and the other virtual (Universitat Oberta de Catalunya). Therefore teachers and students come from four different contexts or practice settings corresponding to four subjects in various disciplines: communication, tourism (from UOC) and economics and biomedical engineering (from UB).

Throughout the entire co-design process exhaustive data collection was performed using several research instruments, with the aim of thoroughly keeping track of the co-design process. In this study, and for the purpose of analysing the means and the results by which students have participated in the co-design process of expanded learning scenarios, we have considered the following research data and instruments: i) questionnaire to students (applied after the intervention), ii) observation and audio recording during the co-design workshops, and iii) brief questionnaire to students after each workshop.

Co-design methodology

The co-design process took place cyclically, through the following five main phases: i) preparation, ii) exploration, iii) envisionment, iv) operationalization and v) assessment and reflection. Phases 'i' to 'iv' consisted of a series of seven participatory workshops in which the six teachers from the four selected practice settings participated along with members of the research team. In all, around 12 participants shared their experiences of teaching practice in the field of inquiry-based learning and technology-enhanced learning. In phase e, the students selected from each context joined the design work groups with the aim of critiquing the prototypes of the learning scenarios designed by teachers, bringing their own ideas and perspectives and thus validating the final designs.

The present study is framed in the last phase of the co-design process of assessment and reflection (phase v). In this phase the prototypes of the learning scenarios are implemented, which means that each learning scenario is enacted in its real context, while the learning experience is monitored and feedback is collected from all the participants. This systematic and iterative process allows the designed scenario to be assessed and progressively refined.

In this phase, students selected from each context (a total number of 11) joined the design work groups (formed of one or two teachers and members of the research team) with the aim of critiquing the prototypes of the learning scenarios designed by teachers, bringing their own ideas and perspectives and thus validating the final designs. These students took part in the same type of participatory workshops used in previous phases, but on this occasion based on the enactment of the learning scenario in their corresponding context of practice. In the last three workshops the prototypes of the learning scenarios were tested and feedback was collected from the students and the teachers. The aim of this exercise was to enable the four designed learning scenarios to be refined based on collected feedback, reflection and discussion by each design team.

Opportunities and pitfalls in students' co-designing expanded learning scenarios

In this section we present a summary of the findings obtained after the first co-design cycle with teachers and students. We discuss these findings in relation to the two research questions guiding this specific study.

Regarding the first question: *Is co-design an effective approach for empowering students' voice and promoting student engagement?*

- Students perceived that they gained knowledge of the learning design process, the learning methodology used and more specifically they obtained a better understanding of the learning scenario they had been involved in as learners, i.e., of their own learning process. This would point to evidence of perceived competence and self-efficacy as suggested by Deci and Ryan (1985):
- Students highly valued having the opportunity to provide feedback from their perspective, especially regarding their problems, concerns and needs, so that the teachers could take this into account in the future. Both students and teachers agreed on the interest of confronting each other's perspectives: students claim to have understood the complexity of teaching and of learning design, the amount of factors that need to be taken into account and the difficulty of satisfying both the teacher and the student view. They experienced the co-design encounters as moments for cooperation with teachers and other students, which gave them the opportunity to know and to understand different points of view, with the idea of benefitting both sides. This observation could be associated with the sense of relatedness proposed by Deci and Ryan (1985).
- Co-design instruments and tasks employed in the workshops (concept and force maps, matrices, diagrams, etc.) have proved useful for supporting dialogue and reflection on learning practice/approach. On the other hand, time seems to be one critical factor in

co-design. A sustained dialogue over time is required to generate the context of trust needed to deconstruct mutual prejudices between students and teachers and allow them to express their ideas clearly. It also takes time and external facilitation for students to come to understand and use certain pedagogical concepts (Bovill, Morss & Bulley, 2009).

- There were several aspects where students felt particularly confident that their contribution might be of interest: assessment criteria, methods and tools to track their work, alternative ways of presenting a learning activity to improve student motivation, organizational issues and timing of learning activities.
- In general, students did not perceive a change in their self-conception, understanding or attitude towards learning after the co-design process. However they admitted to having a greater understanding of the roles of student and teacher as well as a broader perspective of possible approaches to learning and of the variety of learning strategies and tools.
- Facilitators of the co-design process identified by participating students can be summarized as follows: the moderation or direction of the co-design tasks, the willingness of participants to hold a dialogue and cooperate as well as their openness towards the use of new methods and tools. They also felt that starting the discussion by asking them about general problems and then delving into the analysis of each learning scenario was a good strategy.

Regarding the second research question: *Can the student voice bring relevant contributions to the design of expanded learning environments?*

- Some students found difficulties in separating the analysis of what was proposed by the specific learning scenario and the general practice at the university. They had formed ideas about what did not work in the university that strongly conditioned their perspective on the co-design process. Some students were also reluctant towards some innovative components proposed by the learning scenarios. This forced teachers to find arguments for some of the most recently integrated design decisions that they still felt unsure about themselves.
- Students widely considered the IBL approach to be interesting because it “taught them to use their own resources to become more autonomous in the work process”, something that would presumably be a necessary competence in their professional career. They also admitted that this approach increases motivation and might result in more effective learning, which “remains”. Nevertheless, they insisted that this methodology would need a higher level of control or guidance by the teacher, as well as tools to help them avoid getting lost in the process, for instance in the stage of gathering information, given the great amount of information available online.
- Anticipated problems and weak aspects identified by students in the learning scenarios were mainly related with teamwork, organization and assessment, autonomous learning, content treatment and presentation and lack of motivation.
- Technology-enhanced and expanded learning design principles were more difficult to capture in the design process and to reflect in the learning scenarios than IBL

principles. Students were generally quite conservative in their ideas about the use of digital resources. They showed a generally positive attitude towards the proposed TEEL design principles but they had difficulties suggesting specific solutions to be implemented in the learning scenarios and the ones proposed tended to be quite reproductive of usual practices with technology proposed by teachers, for instance related with content presentation. We could say they did not seem to be very knowledgeable about the use of technologies for learning and not very interested in proposing the use of new tools, not even new tools they normally use in their social practices.

- Students also expressed difficulty in sharing experiences with students from universities with different models (face-to-face and online). Rather than regard these exchanges as a source of richness, they considered them a source of unproductive discussions that did not lead to practical or useful solutions.

Conclusions

The findings are consistent with the evidence obtained in previous studies, according to which student-centeredness and teacher-centeredness are not opposite poles of the continuum, which favours the transactional view of the relationship between teachers and students (Elen et al. 2007). Our results show that from the students' point of view the distribution of responsibilities in the learning process must be interactively and continuously negotiated and decided by teachers and learners. Students may accept the role of co-developers of the learning scenario, both as learner and as designer, but they expect the teacher to ensure the conditions for this co-development. On the other hand, students feel engaged by challenging learning scenarios but they also expect these scenarios to be safe enough to ensure that the learning activity they undertake is as effective as possible. This shows that in inquiry-based and technology-expanded learning scenarios it is of critical importance to adjust the balance in the tension between student autonomy and learning support, either indirectly or directly provided by the teacher.

Another conclusion aligned with previous research is that in initial contact with authentic, inquiry-based and expanded learning scenarios, some students may show a "delayed engagement". They may feel some reluctance and misapprehension regarding the approach, since it is so different from the one of more familiar academic models. According to Herrington, Oliver and Reeves (2003) in order to fully engage with this kind of learning scenario, students need to elaborate a process of "suspension of disbelief", which means that they need to accept the fundamental basis for the scenario, and recognize its complexity and therefore its value as a learning experience. Co-design may act as a facilitator for this suspension of disbelief mechanism, but it requires a proper approach and guidelines as well as sufficiently long time involvement from students.

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MAKING IT MOBILE: CHANGING APPROACHES TO CLINICAL LEARNING ENVIRONMENTS

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Introduction

Mobile technologies are increasingly being adopted: institutionally by medical schools and independently by students in order to support learning in the clinical environment [1, 2, 3]. Whilst the ubiquitous nature of mobile technologies brings us one step closer to a vision of learning anytime, anywhere [4], the theoretical basis of mobile learning (m-learning) is poorly understood, inadequately researched and as a result, often poorly supported [5, 6]. This research was a direct result of these concerns.

Critical review of relevant literature

Although too exhaustive to include in this application, an expansive review was done based on the following framework (Figure 1).

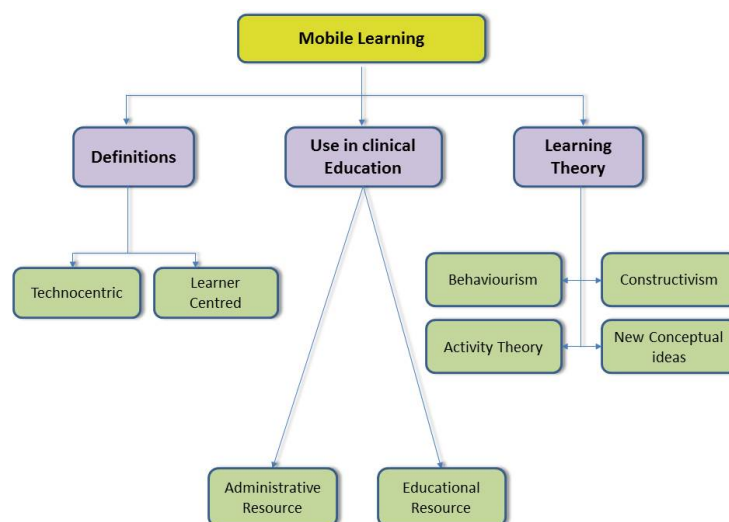


Figure 1. Structure of the literature review

Defining mobile learning

M-learning lacks a universal definition and it is instead often described in terms of its reported characteristics. To others it is a branch of e-learning, (the educational use of technology), distinct only by the mobile nature of the technologies that afford its practice [6, 7, 8, 9]. Whilst this may well ease its diffusion into academia it will inevitably weaken its

contribution and diminish its coherence [10]. My view is that it is a process of learning supported by the use of mobile technologies; where learning is a personal construct defined by the individual, and mobile technologies are; wireless, electronic devices that are easily mobile. This includes mobile phones, smartphones, handheld MP3 players, portable e-book readers, PDAs and tablet PCs but excludes laptops and any other typically wired or stationary device.

Using mobile technologies in clinical education

Mobile technologies have been utilised in various ways to support learning in medical education. Medical schools in the United States paved the way with mobile technologies preloaded with essential university texts [11] and the provision of static electronic learning resources via mobile technologies is now widespread [12, 13, 14, 15, 16]. Additionally they have been used to support assessments [17] and reflective practice [18, 19]. Whilst students generally report high levels of satisfaction with m-learning experiences [16], common barriers to its' utility are a poor user interface [3, 15], and the lack of guidance regarding mobile etiquette or, 'mobiquette' [3].

Theoretical basis of m-learning

Current learning theory supporting m-learning is sparse and in order to progress as an academic field it is imperative to understand and develop its theoretical basis [20, 20, 22]. Due to the breadth of m-learning activities possible it is unrealistic to attempt to apply a single, fixed theory to it and it is more important to develop a number of ways to view and conceptualise the process. Elements of behaviourism, constructivism, and activity theory have been applied to m-learning and new conceptual models are being presented.³

Simplistically, behaviourism is applicable within m-learning when the use of the mobile devices invokes a stimulus response such as through text commands [23]. Constructivism is emerging as the predominant learning theory [22, 23, 24] and it is proposed that mobile technologies provide means of social connectedness and facilitate sharing of experiences, thus meaning is socially constructed by the participants of mobile technology facilitated conversations. These conversations can be between people, through the medium of a mobile technology; or via interaction with the mobile technology itself i.e. web browsing.

Expanding upon constructivism, the literature invited a detailed review of activity theory and its application within m-learning [3, 25, 26]. Historically activity theory has been used in the study of human-computer interaction and posits that learning emerges from conscious activity as a result of our interactions with others and the environment, mediated by tools within the activity system. Commentators therefore suggest m-learning can be thought of as a dialectical relationship between two dominant spaces whereby; learning is conceptually carried out in a semiotic space and physically in the technological space under the influence of the external environment [26].

Theoretical framework

Phenomenon and the theoretical perspective

The phenomenon sought in this exploratory study is: medical students' experiences of using mobile technologies in the context of medical education. In keeping with realist ontology [27] participants views are viewed as external, objective and tangible [28]. However, I acknowledge my approach as a researcher is shaped by the context of the theory I possess and this inevitably influences what I observe. Therefore the reality uncovered is only known probabilistically hence the study was carried out from a post positivist stance [29]. In light of this attempts were made to maintain objectivity and limit bias in order to maintain methodological rigour [30].

Methodology

This research looks to explore a complex human experience thus I have opted to follow a broad qualitative approach that can be compared to a cross-sectional survey methodology [28].

Methods

Sample

The sampling strategy is a hybrid between convenience and purposive. An email was sent to all third year medical students asking those who felt they had experience of m-learning to come forward, thus an attempt was made to attain a group with knowledge of the phenomenon to enable fuller description. Those responding first were allocated an interview. Six third year medical students at Newcastle University took part; two females and four males. The selection of third year medical students was informed by themes from within the literature which suggested they would have a greater experience of m-learning. These are geographical mobility [22], self-directed learners [16], and a greater frequency of ad-hoc learning due to improbability of clinical placements [3]. It was also a pragmatic in terms of their availability.

Data collection

Individual interviews were used owing to their flexibility, ability to gather extensive detail about a phenomenon and capacity to engage difficult and open ended questions [31]. I discredited methods such as focus groups because of their tendency to generate a collective opinion rather than accounts of individual experiences [29]. Interviews were semi structured and topics were generated based upon existing literature, reflection upon personal m-learning experience and discussion with the head of faculty IT [32]. Careful consideration was given to the research questions throughout the process to ensure content was fitting. A pilot interview was undertaken to ensure questions were clear, unambiguous and unbiased.

I reflected on each interview prior to the next, and content was amended for subsequent interviews enabling a fuller description of the phenomenon. A rigid structure was unnecessary as I did not intend to compare individuals. Notes were taken as a fail-safe for any recording errors and to highlight key points to come back to or probe further. The interviews were audiotaped to facilitate analysis. This afforded my ability to revisit the data in its raw form and ensure my developing analysis was true to the data.

Data analysis

Data was transcribed verbatim onto Microsoft Word. It was then organised and explained following thematic coding analysis. Codes are single words or phrases that attempt to capture the meaning of a phrase or sentence. Due attention was paid to negative statements and similar codes were grouped together by common meaning into categories, which closely represented the data but enabled a reduction in its size. Categories were defined based upon their codes and collective meaning. By reviewing the categories alongside the raw data I identified themes which captured something important in relation to my research questions and transcended the data.

Ethics

Ethical approval was obtained from the University Ethics Committee. Due reassurance was given to students as per the confidentiality and anonymity of data.

Aims and research questions

Aim

To explore medical student experiences of using mobile technologies in the context of their medical education, in order to develop a conceptual understanding of m-learning and inform academic practice at the university.

Research Questions

1. How and why are medical students using mobile technologies?
2. What are the barriers and facilitators of their use?
3. How can the university facilitate the use of m-learning?

Presentation and interpretation of results

The results of thematic analysis are presented in Figure 2

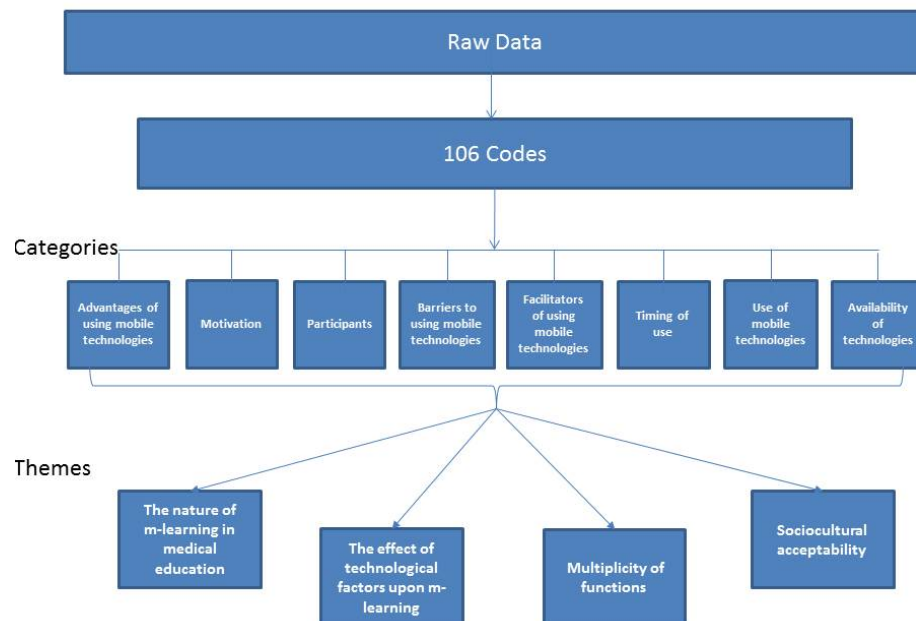


Figure 2. Results of Thematic Analysis

Exploration of themes

The nature of m-learning

The mainstay of m-learning was via smartphones due to convenience and as an adjunct learning aid, not a replacement. M-learning is typically spontaneous afforded by its speed and ability to utilise 'dead time'. It occurs in context with timely access to key facts and often involves an element of repetition.

it's right there when you have just seen it and it's in your memory, so at that time you can either remember it or read about it at the same time and I just feel you remember much more doing it that way. (F20)

Participants alluded that m-learning may encourage learning to become a process of knowing how to access information rather than actually understanding and brought up consideration for trustworthiness of resources. Trust is increased when references were provided or it was an electronic version of a known textbook.

I'd say maybe this is where the dangers come in, whether I know that I can access certain things so quickly like it's kind of a question of whether I need to devote this to my long term memory, or can I know that, oh I can just access that again just by typing it in. (E120)

I am sometimes wary that not all the information online is always reliable, whereas I would be quite happy to take for read something from well-known textbooks. (B213)

Multiplicity of functions

Participants choose to use mobile technologies due to their all in one nature. Primarily they would access information via the internet. Secondary to that is accessing embedded medical applications, PDFs and textbooks. The administrative function of mobile technologies is deemed an essential part of m-learning as it enhances productivity and communication with relevant people. However participants acknowledge the distractibility of these devices and acknowledge this influences their negative image hence a call to establish mobile etiquette.

You could be in a calendar, sending an email looking at a PDF reading an article, you know anything like that. (F32)

But I think there is still an etiquette needed because on the other side of the coin the phones still have cameras and other things. (F34)

The effect of technological factors upon m-learning

Participants have come to expect a stable internet connection thus in hospitals where connectivity is poor they feel unsupported and frustrated. Consequentially static applications enable them to overcome this but they are aware if something has been designed specifically for mobile technologies and this influences their persistence using that resource.

When there isn't a native mobile application it is clunky and disorganised. (D42)

Sociocultural Acceptability:

Participants expressed trepidation using phones in a clinical environment for a mixture of reasons including fear of it interfering with equipment or doctor-patient interactions and the unprofessional image they portray. They feel doctors' attitudes are able to facilitate this in either direction and there is an assumption that a generational gap impacts upon the social acceptability of devices. There is however, a perception of increased uptake of mobile technologies by doctors on the wards and positive interest being shown by staff.

Well you know phones in hospitals, it's something that people frown on really isn't it. (A34)

I feel better using it when doctors are encouraging of its use; most I have encountered have a fairly pro-technology attitude. (B176)

Discussion

Participants use their mobile devices sporadically as a supplementary learning resource in order to gather small chunks of information in a timely manner and one heavily based in the context of the clinical situation. They choose to do so due to the convenience and relative ease which is afforded by the portability and high functionality of the device giving them access to a breadth of information as and when required. Whilst this process is facilitated by their intuitive designs sociocultural factors also play a significant role and in reality there remains an overshadowing negative perception of mobile devices within the clinical environment. Thus for m-learning to become mainstream within medical education a shift of attitudes is required.

My results substantiate the stance held both within medical education literature and outside of it positing activity theory as a useful framework from which to view m-learning [3, 22, 25, 26]. Each element of the activity system is described by participants within this study: the mobile technology is viewed as the tool to mediate attaining outcomes, central importance is given to the social context of the activity and participants aptly describe how their use of mobile technologies is influenced by rules of conduct and their role within the community. Interestingly the findings demonstrate that rules are not explicit and participants develop self-imposed rules to guide their use. This creates tension within the activity system and often presents itself as a barrier to achieving outcomes.

The administrative functions of devices are regarded with great importance by the participants of this study, so much so it is factored into participants' descriptions of m-learning. They suggest the administrative function should be regarded synonymously with learning on the device as it improves their productivity, supports their organisation of learning and resources and enables them to converse with others by email which has brought about collaborative learning. This integration has led to a blurring of the lines between what may have been traditionally considered learning and what may have been considered administration and it now seems somewhat artificial to separate the two due to the high functionality of these all-in-one devices.

Considering my results alongside Engstroms [33] depiction of an activity system I have created conceptual model of m-learning in a clinical context (Figure 3). It is intended that this should be informative for curriculum development and the integration of m-learning strategies.

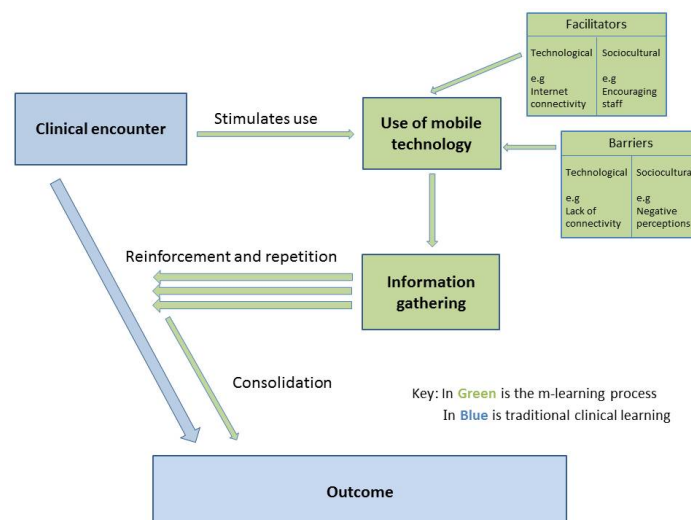


Figure 3. My conceptual model of the m-learning process

Study Strengths and Limitations

The sample was self-selecting; both interested and motivated to discuss the topic in question. Whilst this improves the validity of a qualitative study [34], it means that other valuable perspectives on the phenomenon may have been missed and my sample size makes it impossible to capture the phenomena completely. Despite barriers and facilitators not being part of my main aim, participants' responses identified that they were important and I concluded they would be the crux of informing practice and I therefore focused on this research question in depth. In reality identifying barriers and facilitators may have been better suited to a detailed exploration on their own.

Implications for practice

How can the University facilitate the use of mobile technologies?

Institutional support for m-learning encourages the use of mobile technologies [35, 36] and participants within this study describe a lack of support from their University and perceive this as a barrier to m-learning. Given the utility participants attribute to their use of mobile technologies in their studies I believe it is worthwhile developing support for its practice. As this is a very practical research question I have displayed the strategies to support m-learning in bullet form.

M-learning can be supported by:

- Developing and disseminating rules of mobile technology use – 'mobiquette'.
- Addressing negative perceptions by:
 - making staff aware of the legitimacy of using mobile technologies as a learning device;
 - making staff aware of any m-learning strategies employed by the University;
 - consider providing an identifiable case for use in hospital so that the technology is branded as a learning tool.

- Formatting existing, or designing new resources to be optimised for mobile technologies by considering that resources should be:
 - optimised first and foremost for smartphones;
 - quick, easy, and convenient to use;
 - present information in bite-sized chunks;
 - easily searchable;
 - up to date;
 - offline where possible;
 - aiming to avoid activities that require prolonged typing.
- Providing students with timetable access on their mobile technology.
- Providing internet access in the hospital.

Implications for future research

Simplistically there would be benefit from reviewing the impact of the suggested implications for practice. Additionally a deeper review of the applicability and contribution of various learning theories in order to inform the design and delivery of future m-learning resources and strategies would be advantageous to the field. Interesting research would arise from further exploration of the concept of Google assisted memory and the question: does knowing how to access information equate to knowing?

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MEDICAL STUDENTS' PERCEPTIONS OF SOCIAL MEDIA – SAMPLE OF HACETTEPE UNIVERSITY

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Abstract

The main purpose of this research is to analyze systematically the metaphors related to the social media concept, used by 1st term students of Hacettepe University, Faculty of Medicine. Study group includes the students (N = 336) of the Faculty of Medicine of Hacettepe University in the 2013-2014 academic year. Research data was collected both via questionnaire. All data gathered during the research process were analyzed with frequency (f) and percentage (%) values related to metaphors and acquired conceptual categories.

According to the findings gathered in the research, 202 metaphors related to “social media” were read and analyzed using the content analysis technique. In the process of creating conceptual categories, related literature was examined by three researchers; and taking into consideration the studies containing social media descriptions, the metaphors created by first term medical students were separated into four categories. Of these categories (i) communication tool; the use of social media by individuals as a tool to interact with people they want, (ii) source of information; the use of social media by individuals as a tool to get information about any people or event, (iii) a threat; misuse of the social media and its possible harms and (iv) stirrer; the fact that social media has both beneficial and harmful features.

Introduction

Face to face communication has been replaced by technology-oriented ways of communication with Internet's becoming an indispensable component of life. This situation has introduced new relationships established via Internet (Murray, 2008). Social networking sites present themselves in the centre of this kind of communication established on a virtual platform (Tiryakioğlu & Erzurum, 2011). Social media, which has entered out lives as an expansion of *Web 2.0*, can be described as platforms expanding with social interaction by using Internet and web-based technologies, with high accessibility and including contents and sharing. This communication is established by using the sites such as Facebook, Twitter, LinkedIn, MySpace etc. These social media sites offer the opportunity to create a personal profile page and communicate with other individuals for free. Individuals can post their

photos, state what they are doing and where they are and send messages to people (whether or not they know them).

In the information age, the use of social media increases rapidly, especially among young adults (Pempek, Yermolayeva & Calvert, 2008). Especially a large segment (82%) of the university students described as young adults is a part of the social media (Quan-Haase & Young, 2010). The use of social media varies according to individuals' characteristic features and why and how they use the Internet (Çetin, 2008; İşbulan, 2011). Thus how and for what purpose individuals use social media, good and bad experiences they have had and the effect of social media in terms of education are important matters that need to be analyzed. In this context, the point of departure of this study is the need arising from the former completed studies on social media because there is not a single research that metaphorically focuses on the ideas of students. Metaphors are a means of perception. Metaphors are described as *a strong mental scheme and modelling mechanism that enables individuals to understand and shape their worlds* (Arslan & Bayrakçı, 2006).

Metaphors provide a mental framework for thinking about a concept (Shuell, 1990). In a metaphorical relation, three principals are said to exist (Forceville, 2002). These principals in question are explained below by using a metaphor sample in the research:

- The subject of the metaphor (The *social media* word in this sentence: *Social media is like a friend.*);
- The source of the metaphor (The *friend* word in this sentence: *Social media is like a friend.*);
- The features that need to be attributed from the source of the metaphor to the subject of the metaphor (The sentence starting with *because*: *Social media is like a friend. Because it is always present in the loneliest times of a person.*).

In this context, the main purpose of this research is to analyze systematically the metaphors related to the social media concept, used by 1st term students of Hacettepe University, Faculty of Medicine in Turkey. It is considered that these research results would open up an opportunity in the body of literature to look at the social media concept from another perspective. For this purpose, the answers to the questions below have been looked for:

1. What are the metaphors that 1st term medical students have on the *social media* concept?
2. How can these metaphors be categorized?

Method

Participants

Study group includes the students (N = 336) of the Faculty of Medicine of Hacettepe University in the 2013-2014 academic year. However after the elimination of people who do not wish to participate and who cannot participate and empty questionnaires, data from 202 participants was gathered. Out of the 202 people whose data was used during the research, 113 (56%) were males and 89 (44%) were females.

Data Collection

It was made clear that participation in this research was voluntary and that it was not obligatory for the students who did not wish to participate to fill in the questionnaires. The students were requested to answer in a given time the demographic questions and to write a metaphor clarifying their feelings and thoughts on social media. Perceptions of the students participating in the research were gathered by their completion of this sentence: *Social media is like...., because.....* The relationship between the subject and the source of the metaphor was assessed with *like*. By using *because*, the meaning that was attached to the metaphor and the reason for that were aimed to be revealed.

Data Analysis

The metaphor sentences of the first term students of the Faculty of Medicine were typed in using MS Excel along with the other study group participants' information. After the input of all the metaphors, they were sorted alphabetically. During data input, empty questionnaires with no metaphors, questionnaires lacking metaphors' reasons and questionnaires with more than one metaphor were eliminated. In addition, some students just shared their thoughts on social media in general instead of providing a metaphorical image. And some provided a metaphorical image without stating a basis for it. Therefore 44 questionnaires of the 246 gathered in the beginning of this research were ruled out.

Then the metaphors provided by the students who participated in the study group and whose questionnaires were included and the source and subject of the metaphors were analyzed in terms of their relationship. As a result of this analysis, each metaphor was linked with a specific theme regarding the reasoning behind it. As a result, 4 different conceptual categories were determined. These conceptual categories were matched with metaphors. An expert in the domain of education technologies was requested to state opinions on final conceptual categories and matches determined by researchers. The credibility of categorizing the concepts was calculated using this formula:

$$\text{Credibility} = \left(\frac{\text{Consensus}}{\text{Consensus} + \text{Divergence}} \right) \text{ (Miles \& Huberman, 1994).}$$

Research data was collected both via questionnaires. All data gathered during the research process were analyzed with frequency (f) and percentage (%) values related to metaphors and acquired conceptual categories. Then 4 conceptual categories obtained in this research related

to the social media concept and each feature they possess were introduced with the assistance of the metaphor images provided by the participant.

Findings

According to the findings gathered in the research, 202 metaphors related to *social media* were read and analyzed using the content analysis technique. In the process of creating conceptual categories, related literature was examined by 3 researchers; and taking into consideration the studies containing social media descriptions and structured focused group discussions, the metaphors created by first term medical students were separated into 4 categories. Of these categories (i) *communication tool*; the use of social media by individuals as a tool to interact with people they want, (ii) *source of information*; the use of social media by individuals as a tool to get information about any people or event, (iii) *a threat*; misuse of the social media and its possible harms and (iv) *stirrer*; the fact that social media has both beneficial and harmful features. These categories were introduced below.

Communication Tool

It is apparent that the most often repeated metaphors in the communication tool category are pigeon (16), bird (8) and spider (7). Samples related to the metaphors in the communication category are listed below.

- Student no. 67: Social media is like a pigeon because it enables free communication between people.
- Student no. 87: Social media is like a bird because it can send a message to everywhere easily.
- Student no. 93: Social media is like a spider because even a little touch on the web it makes can be felt from everywhere and it allows us to reach everything.

Threat

Some other metaphors stated by participant university students come under the threat category. The most often repeated metaphors were concluded to be drugs (12), cigarette (5) and bacteria (5). Samples related to the metaphors in the threat category are listed below.

- Student no. 200: Social media is like drugs because it causes people to kill time and get numb. It also stupefies people and prevents them from thinking and using their time in useful stuff.
- Student no. 193: Social media is like a cigarette because it is considered harmful from the outside but when one indulges they become addicted to it. Despite the harms, one cannot live without it.
- Student no. 167: Social media is like bacteria because it is mostly harmful and spreads fast.

Stirrer

The most often repeated metaphors under the stirrer category are concluded to be sea (4), dumpster (3) and human (2). Samples related to the metaphors in this category are listed below.

- Student no. 219: Social media is like a sea because it is endless and enormous so it contains everything. When you go into it, you are aware of it but it is not aware of you. If you cannot swim, it becomes a grave for you.
- Student no. 215: Social media is like a dumpster because it may be useful or not useful. The things you like and dislike exist in it. It looks like a place where crumbs of ideas pile up.
- Student no. 228: Social media is like humans because you can trust no one.

Source of information

Lastly, the most often repeated metaphors under the source of information category are concluded to be tree (5), encyclopaedia (3), world (3), etc. Samples related to the metaphors in this category are listed below.

- Student no. 128: Social media is like a tree because it holds different kinds of information in various ways.
- Student no. 134: Social media is like an encyclopedia because it includes all kinds of information.
- Student no. 140: Social media is like the world because you can find what you look for in it.

Conclusion and discussion

The importance of the increasing interpersonal interactions as a result of developing technology paves the way for new communication platforms and methods. Social media is one of these new communication platforms. Individuals communicate, interact, share, cooperate and conduct learning activities through these networks.

In this research, the aim is to determine the perceptions of first term medical students in terms of social media using the metaphorical analysis technique. Of the participating students, 89% state that they use social media effectively. This percentage showed similarities to other research findings where 73.7% of Öztürk and Akgün's (2012) students, 79.3% of Toğay, Akdur, Yetişken and Bilici's (2013) students, 89.40% of Kert and Kert's students (2010) were determined to use social media effectively. Another significant and similar finding was obtained by Tiryakioğlu and Erzurum (2011). In these studies, it was ascertained that academic staff/personnel of the Faculty of Communication Sciences also used social media actively. It is determined that the academic staff/personnel of the Faculty of Communication Sciences especially prefer Facebook and use it a lot.

Perceptions of the students in terms of social media fall into 4 categories (*communication tool, source of information, threat, stirrer*). When these categories are analyzed, it is assessed that

students use social media mostly as a *communication tool*. The *communication tool* category (81) is respectively followed by the *threat* (48), *stirrer* (37) and *source of information* (35) categories. These findings are supported by few previous research results in the subject. This result is similar to these results: Toğay, Akdur, Yetişken and Bilici (2013) determined that 84.5% of vocational school students, Öztürk and Akgün (2012) determined that 81.6% of the students of the Faculty of Educational Sciences used social media to communicate.

In addition to that most of the students consider social media as a harmful platform. This finding complies with the research findings where Hergüner (2011) found that out of 180 Physical Training and Sports undergraduate students who participated in the research, 46.2% thought social media had more harms than benefits. These findings also show similarities to those in the literature where Öztürk and Akgün (2012), Kert and Kert (2010) conducted a study and found respectively that nearly half of the students (48.9%) and 30.13% of the students had negative perceptions of social media.

Even though students think that social media harms them a lot or it does not affect their academic success, the fact that they also think that they do not use social networks in a positive manner indicates that they do not benefit from positive features of social networks. This brings the necessity of social network consciousness and the use of positive features they possess into question. On the other hand when related literature is analyzed, a lot of emphasis on the fact that social media can be used as an education tool exists. It is considered that this kind of integration would contribute to lectures, enriching and sharing the sources and extracurricular group studies. This integration can assist in the use of extracurricular activities in favour of learning and create a platform enriched by technology and increase students' level of motivation and cooperation. Social networks can be used as an assisting tool for joint study groups (group study); for research, questioning and debating abilities; for creative thinking and problem solving abilities by sharing effectively materials (video files, audio files, pictures, tables, presentations, database and other websites containing information); following current news, people or groups; and participating in debate platforms. Ajjan and Harsthone (2008) suggest social media is an effective tool to use in the educational context, in that it boosts students' level of learning, enables the interaction between school – student and student – student, increases students' level of satisfaction for the classes, improves the writing abilities of the students and integrates easily with classes.

In a study where Yuen and Yuen (2008) conducted with undergraduate students, they created a class carried out by the mixed learning method on a social media platform and pursued a part of the learning on that platform. At the end of the term students were requested to state their opinions related to this process. Most of the students stated that the process where they discussed the topics related to the class on that social media platform facilitated their communication and enabled cooperative learning, that they felt themselves a part of a community and that it contributed to their professional development. As a result of the study, it is realized that students had positive attitudes towards these kinds of platforms, felt comfortable, checked the activities related to the platform easily and used them as a tool for

digital media sharing, posed questions in a common view and opinion based framework, shared class materials, created study groups and communicated with classmates.

Comparably, Toğay, Akdur, Yetişken and Bilici (2013) conducted a study through social networking tools on 60 students during a term to assess the effectiveness and accessibility of the social media in the process of university education; assisted the students with an active social media-based learning and made an assessment in terms of the impacts of this assistance based on student opinions. As a result of this study, it was recognized that the assistance of educational processes by social media had a positive impact and facilitated and improved learning processes.

According to the study conducted by Tekinarslan and Güner (2011) after using social media, students stated that their ability to express themselves improved positively (57.6%). Especially the fact that even though the Faculties of Medicine have a large number of students, communication between students and instructors in the department is decreasing. The importance of communication between instructors and students is undeniable and any platform contributing to this communication should be utilized. In this context, the use of social media is considered to contribute to students' communication with their instructors. Moreover using it as a platform for academic and social announcements and conducting group studies there would contribute to the process. Thus, it is thought that communication between students and instructors can also be extracurricular. As a conclusion, the fact that almost all students use a social network should definitely be assessed in terms of educational potential.

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STUDENT VOICES: INNOVATIVE PEDAGOGICAL MODELS FOR COURSE DESIGN

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Abstract

Ever since Marc Prensky introduced the term Digital Natives there has been an ongoing debate about digital skills and expectations of today's students. Some, like Don Tapscott, claim that they are grown up digital, others claim the term 'digital native' is overrated and wrong. This paper reports in depth interviews and research with students, addressing their experiences, competence and expectations regarding use of digital technology in higher education. The paper includes students from three different higher education institutions and from different study programs. Some of the students were part of a larger project aimed at flipping the lecture, meaning all lectures were replaced with video instructions, and the "lecture time" used alternatively. The findings show that students' expectations on pedagogy and use of technology in higher education are strongly affected by current practice as well as students' prior experiences in K1-13 education. Students, however, quickly embrace new ways of learning when introduced to them. The paper reviews differences in the student use of digital technology for learning.

Overview

In 1999 Don Tapscott (1999) wrote *Growing Up Digital*. This claimed there was a new generation that learned and communicated differently than previous generations due to the use and impact of digital technology. Marc Prensky (2001) introduced the term Digital Natives to explain the habits of this generation. Veen and Vrakking (2006) introduced the term *homo zappiens* to describe the same trends and practices. Still, many still refuse to accept there is a fundamental difference between the generation born after 1990 and previous ones (Bennet et al. 2008). Whether this generation learns differently as stated by Palfrey and Gasser (2008) or demands different approaches, has been heavily debated (Bennet & Marton, 2010). Many voices (Helsper & Eynon, 2010; Engen et al., 2014; Houlton, 2010) have questioned these arguments. According to Rikhye et al. (2009) no significant empirical evidence exists to support Prensky's conjecture. This paper remains neutral. This study aims to describe the practices students use when they enter university and how strongly these existing practices affect learning in terms of their expectations on what it is like to study. Practical questions centre on how students, when exposed to flipped classrooms, experience learning? As claimed by some, do students expect a different approach (Prensky, 2001; UNESCO, 2011)?

Traditional teaching patterns assigned textbooks for students to read, listen to lectures and take class notes, taking tests in class or on campus and work on problem assignments outside school. Lectures have been the main way of teaching in Universities since their foundation in Bologna in 1088. This is not the most efficient way of learning according to a metanalysis of 225 undergraduate STEM Teaching methods (Freeman et al., 2014). Studies show that only 10% of students remember what is taught in lectures. This has led some to question the lecture as the best way of teaching and learning (Mazur, 2009).

Technological development has lowered the threshold for implementing digital technology in teaching and learning. Even though surveys like the Norwegian Monitor (Hatlevik et al., 2013) show progress is slow, there are many lecturers experimenting with new ways of teaching and learning using digital technology. One very popular technology is the use of video. The success of Salman Khan and Khan Academy is well known. Since 2012 more and more universities deliver their courses online, as MOOCs, relying heavily on use of video for delivering instructions (Kunnskapsdepartementet, 2014). Lage et al. (2000) discussed the advantages of the 'inverted classroom'. Instead of giving lectures, instructions were recorded and made available to students to see at home or in computer labs, with class time used to do what traditionally had been assigned as homework. Thus students could watch and listen to the instructor at home, and do tasks with the instructor present, where they could talk and ask questions. This method, later termed flipped classroom (Baker, 2000; Bergman & Sams, 2012), has been very popular among teachers in secondary and upper secondary education. In the Norwegian Horizon Report (Johnson et al., 2013) the flipped classroom is viewed as one of four technology outlooks that will be adopted into Norwegian schools within one year or less (along with bring your own device (BYOD), cloud computing and social media). Yet some critics claim that flipping the classroom does not change the fundamentals of learning. Shelley Wright (2012) claims that a lecture is still a lecture regardless of given in class or on video.

Significance of the study

Many argue today that students – called the net generation, digital natives and homo zappines – are learning differently compared to previous generations of learners, and thus require different approaches to learning and methodology. Others claim that this is a misconception. By asking students themselves about their expectations and experiences regarding learning and use of technology for learning we can get a better understanding of how they learn, the basis for their expectations, and their feed-back on various methods. This is especially relevant when it comes to the flipped model vs. traditional lecture. Advocates of the lecture emphasize the personal connection and communication that happens in the lecture hall, even though studies question the effectiveness of the lecture when it comes to learning (Freeman et al., 2014). It can be claimed that videos are non-personal, and over-rated as learning tools because of the non-personal format as compared to the interaction that happens in the lecture. The present study aimed to get a better understanding of how students experience change from traditional lecture to the flipped model.

The focus of the study was to answer three questions:

- What experiences and strategies do the students have prior to entering higher education when it comes to using technology for learning?
- What are their expectations of teaching and learning in higher education, with an emphasis on the use of/implementation of digital technology in their learning experience?
- How do the students react to and experience learning when taking part in the flipped classroom model?

Methodology

In 2011-13 the project “Metodefag i fremtiden” (Learning math and statistics in the future) looked at how to implement digital technology in math teaching to improve student learning. The project initially ran three pilots: two pilots at the *Norwegian Business School* (BI) (one in the Oslo campus, one in Stavanger), and one pilot at Høyskolen Sør- Trøndelag – HIST (Sør-Trøndelag University College). Since results from the pilot in BI Stavanger were so interesting, an additional pilot was conducted at HiST. The classes at BI Oslo and HiST were maths; at BI Stavanger it was in statistics. Students at all campuses (BI Oslo, HiST Trondheim, BI Stavanger) were given use of video as a supplement to or replacement of the lecture. In the first pilot at BI Oslo and HiST, videos were supplements. In BI Stavanger all lectures were replaced by video. In the final pilot at HiST almost all lectures were replaced by video. In these two final pilots lecture time was replaced by work sessions with teacher assistance, as in the flipped classroom model.

As an additional study the project Student Voices was established, to see how students responded to these changes in teaching and learning. It was important to get both teachers’ and learners’ views on the change in methodology. During the study, students in involved classes were interviewed about their experiences and expectations. For the classes at BI Stavanger and HiST Trondheim most of students attended the interviews. These were classes of 40 – 50 students. For the class at BI Oslo a group of 20 out of 300 students attended the interviews. Apart for the group at BI Stavanger, students were interviewed once in a group. For the group in Stavanger they were interviewed twice, prior to the final exam. They completed both group and individual interviews. This group had more in-depth interviews because this class had the most extensive pilot. In this class all lectures were replaced with video, and in the lecture time the teacher was available for students who had questions. Interviews were conducted as conversations with the students, but with an interview guide. This was to get student voices and experiences without preconceptions interfering. In addition to these conversations with the students in the pilots, random groups of students at BI Campus Oslo were interviewed about their expectations and practice.

Findings and discussions

It may look as students enter higher education with limited experience of learning strategies. They are used to “lecture pedagogy” – being lectured by the teacher and with limited use of

ICT. When asked about the use of ICT in education prior to entering higher education, they emphasized PowerPoint, Word and the Learning Management Systems (LMS). It seems like these tools were used as a one-way communication tool, from teacher to students. Some students used Dropbox for storing and sharing documents. Some used Facebook to organize collaboration in groups. This is, however, something they initiated on their own and not something they learned in school. As conversations progressed, students revealed more extensive use of digital tools than at first reported. As one student said at end of the interviews: "I am more digital than I realized". What the conversations revealed is that students' experiences with digital tools for learning are limited when it comes to their educational experiences. When it comes to their actual use of digital tool they are unaware of how much they actually use technology in their daily lives. All students reported using online video services like YouTube. Some used Khan Academy, some watched TED Talks, and some even reported having attended courses at Coursera.

The study findings indicate that when students enter higher education they have a conservative view on higher education. The lecture has a strong hold in their expectations. Students feel the lecture is safe and predictable, and important for creating interest and inspiration in subjects. The students rely heavily on teachers' advice. Even though there are many materials online, many students are reluctant to go and search for this content because they say there is so much content online and they don't know what is important or relevant for the exam. When asked about the use of video for learning, students who haven't experienced flipped learning say video is great as a supplement to the lecture but not as a replacement. They fear that by replacing the lecture with video the personal touch and communication will be lost. For a generation we know spends so much time on-line, they express fear of losing personal face-to-face aspects of their education.

For students who have been subject to flipped learning results differ somewhat from the answers from of other students. Prior to the pilot, they had the same preconceptions as the rest of the group. Students reported initial scepticism when the teacher in the first lecture announced that there would be no more lectures this term. When the students were asked how long this scepticism lasted one replied "one week, until I got the first video". After being comfortable with the video lecture method, the students did not miss the traditional face-to-face-lecture. In fact students pointed out a lot of advantages the videos had compared to lectures. The students themselves pointed out that now when they had the lecture on video they did not need to multitask, meaning taking notes and listening at the same time. In a lecture the teacher kept on talking while they were taking notes, and it was easy to miss some lecture content. They could not make the teacher stop while taking notes, nor ask her to repeat. When it came to the video they could stop while taking notes, rewind and repeat if something was unclear. While videos on average were 7-12 minutes, students reported spending on average one hour on each video due to this process. Most students saw the videos once, but some reported watching them more than once. They all reported that they would re-watch the videos before the exam.

Students also reported it was easier to understand and remember content when they had videos. After the lecture they commuted, went to other lectures, to work or the gym and forgot much of the lecture content. They could watch videos at times of the days that were convenient. When asked about their study habits, some reported that videos were watched as part of a traditional study regimen, watched like they would do if they were to read a book. Others reported watching in more “untraditional” settings like in the commercial breaks on TV. Math teachers often complained that students don’t “talk” math. The students reported in the interviews that by having these videos, with both oral and written instructions, they got a better understanding due to the fact that the teacher talked math. It made it easier to comprehend the material. One student reported that she had taken this course previously at a different school and had a hard time to understand. Now she felt a different kind of mastery thanks to the oral instructions on the videos.

When it came to the fear of depersonalization of the campus experience due to the fact that the teacher was replaced by video, the students reported the opposite. They said that this teacher was the one they had the closest relation to. Because he did not lecture, but was available for dialogue and questions, they felt that they were more connected in this course than in the other more traditional lecture-based classes. The students liked the fact that it was the same person on the videos and in class. They were sceptical about videos made by other teachers. They showed a strong ownership regarding “their” teacher. When it came to complaints, they revolved around issues like not enough time with the lecturer, having to wait while he was busy with other students and having questions while watching the videos the teacher was not there to be asked. These issues led to the need for students to be disciplined and write down their questions. Still it was easier to ask questions in these “workshops” that had replaced the lecture, than in a lecture hall.

When it came to the issue of how much time the students spend on working with the material in the course, most of them reported that due to the structure, with the curriculum divided into video lectures, this was the course in which they spend the most time studying. One of the students, who liked the videos, complained that this structure took much time. His fellow students opposed this statement. They claimed that watching the videos, and taking notes, did not take more time than attending lectures, they did only spend their time differently. Also they were more focused while watching the videos, while in the lectures it was easier to lose attention.

An overall conclusion after speaking with the students is that they were very satisfied with this way of organizing their course. In the final interview right before the exam they expressed that they were not stressed out and in fear of having missed out of anything. They all reported that having these videos, and the structure of the course made them feel in control and empowered towards their own learning.

Conclusions

From our findings we find three challenges for the current education system:

- The first challenge is that the students' expectations towards higher education is very colour by their prior experiences in K-13, and the existing models of higher education. If they don't have experiences from alternative models of teaching and learning, they make no demand for change when they enter higher education either. Even students who are used to alternative teaching, using technology for learning, don't think that this will be a part of higher education. This might be one of the reasons higher education don't experience a demand from students for pedagogical innovation using technology for learning. The students feel comfortable with the lecture model, it feels like a safe and predictable environment.
- The second challenge is the technological divide. All students reported high frequency use of technology for learning and communication in their private lives, and low frequency technological use while in education. It is difficult to get a grasp of how accurate this use is, because much of the student's technological use is "invisible" to them, and they don't connect it to their learning. When asked they agreed that they use a variety of tools for learning, they just did not connect it to learning when asked. This supports the theory of digital natives, and the fact that they use technology for a variety of uses without thinking of it.
- This points to the third challenge. Because the students today are so tech savvy, and they are used to change of habits. They easily adapt to new ways of teaching and learning when exposed to this. It turns out that when given the choice they prefer new models. Some of the students who had been taught though the flipped model were frustrated when they returned to the lecture model because they found the lecture model so disorganized.

Our findings show that the students are very much affected by how they have been taught in K-13 education, and that the expectations they have towards higher education is reflected by the traditional practice, more than their digital daily lives. But when you expose them to new ways of teaching and learning they quickly adapt to new use of technology and pedagogy. They like the flexibility given by video instructions, the feeling of control of the learning experience. Contrary to what many would expect this gives them a more personal learning experience than the traditional lecture.

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LECTURE VS WEBINAR: ENGAGEMENT AND DISTRACTION IN DISTANCE LEARNING ADULT TEACHERS

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Introduction

The landscape of learning is currently witnessing convergent streamlines of change. Among potential recipients of education interventions an increasing request towards high quality education can be perceived. Simultaneously, the community of educators/instructors is striving towards increasing the offer, making it more democratically available and improving the service. The movement for openness of learning content and courseware is pushing a paradigm change and a need for new approaches in using ICT for smart environment. There are numerous fields of study which can profitably be utilized in planning distance learning (Oblinger, 2013; Salmon, 2014) or blended courses (see for instance Ligorio et al., 2006; Merrill, 2002). Further to such studies a new thread of investigations recently emerged regarding quality and efficiency of MOOCs (Downes, 2013; Morrison, 2013; Read & Rodrigo, 2014; Oblinger, 2013). In fact MOOCs, which were born with a promise of democratization and of improvement of teaching quality, provide us with information on huge numbers of subjects and on courses repeated several times, thus granting strong external validity to the performed studies (Kim et al., 2014). Moreover, the line of research dealing with study motivation is also reviving, in considering motivation and volition in distance learners and also in exploring causes and consequences of nowadays study environments, in which students make use, with multiple goals, of their own electronic device (BYOD – Bring Your Own Device) (Rosen et al., 2013; Park et al., 2013).

Here we propose an investigation on data collected in the past academic year within a blended course devoted to adult students aimed at a post-graduate training, who were prevalently, and simultaneously, full-time engaged as high school teachers. The reflections we suggest are based on the analysis of the answers provided by the students to a questionnaire of final evaluation of the course. We shall devote attention to the problem of the complex interplay among engagement, motivation and study context. We ought to anticipate that the group we worked with was extremely motivated by the tight connection between course completion and future job stability. We shall examine their difficulties due to the time limitations for study (concentrated in a few months, and in few parts of the day) and to the interferences between study and context requirements (family and social context). We investigated whether it is possible to describe the interplay between such forces and the motivational aspects. We shall

consider various pertinent research fields and we shall synthetically refer to the hypotheses and the results of each. We will report on the results concerning the motivation, the problem of time (how much and when to study), the choice of the resources (what to study and what one would like to) and the causes of disturbance (if any), external or internal.

Background

Lifelong learning

Research on Lifelong Learning is copious, especially because of the increasing interest and need of adults to approach frameworks of formal education and become students again. This happens to those who must attend refresher courses, post-graduate courses, training stages or habilitation tracks, such as, according to current Italian regulations, TFA (Tirocinio Formativo Attivo) and PAS (Percorso Abilitativo Speciale), which are courses for school teachers holding only temporary positions. These are people already holding a degree, working, who are motivated to complete such an education program with the aim of obtaining or stabilizing their teaching position. The opportunity to resume study is facilitated by the fact that distance and blended courses are available, which, as it is well-known, reduces logistic problems, allows choosing times and places for attendance and study. Unfortunately, reducing logistic problems not always corresponds to a complete removal. It may be unnecessary to transfer to classrooms places, it may be possible to attend to lectures from home in the evening, or at night. However *time* is required, that is probably the scarcest supply of working students, and also *engagement* is needed, in listening, reading and studying the course material. A mental effort is requested even during Distance Learning or Enhanced Learning. Finding extra time after work may be troublesome, even more so to exploit it for study with concentration and persistence in order to elaborate information.

Learning problems may occur due to the peculiar character of the students and to the study material, to defects of material planning, as it has been studied and pointed out by researchers in the field of multimedia learning (see Mayer, 2005).

However also other aspects may come into play, among which those related to motivation and to the digital context. Research on BYOD, on multitasking and on volition displays a framework of problems of attention which may affect blended students. One in particular is concerned with the problem of interference due to the multi-purpose use of the available devices and the consequence of being always connected and available. As a consequence, the study is often interrupted: by receiving a text ringtone, or the alert of a news feed the student may turn its attention to such stimuli. Sometimes it may be the matter of a few seconds of interruption, in other instances time goes on and the concentration is lost. Rosen (Rosen et al., 2013) report that even during a short term (15 minutes) observation students, aware of being observed, were unable to stick the attention to the task, with an average of 6 minutes on the task before switching. Splitting the attention among several tasks makes the process slower in most of the cases, it reduces the quality of learning, and also the amount of acquired information (Monsell, 2003; Arrington & Logan, 2004; Pashler et al., 2013; Paoletti, in press). Besides external sources of distraction, internal sources may compromise elaboration and

learning. This is the case of task-unrelated-thinking and of *mind wandering*. In daily life we often find ourselves thinking to something having no connection with the current task, or we get stuck fantasizing (Risko et al., 2012). *Mind wandering* consists of a shift of attention from an exterior stimulus to internal thoughts which seems to compromise coding information of external origin. Task-unrelated-thinking and mind wandering can disrupt external information coding as much as a phone ringing (Risko et al., 2012). Quoting Mayr and Bell (2006) there exists indeed a “global switch cost” linked to the mere opportunity to perform multitasking, to the perception of having to perform more than one task, or homework to be prepared or graded.

MOOCs and dropout (macro and micro)

MOOCs (Massive Open Online Courses) are well-known as the emerging educational resources, as they carry a great expectation in terms of inclusion, democratic access, quality of instruction (Oblinger, 2013; Conole, 2013; Salmon, 2014). At the same time, problems of isolation and low engagement experienced by learners using such resources are also well-known. The consequences are clear: low performances, high rate of dropouts. The dropout phenomenon comes in two aspects: a macro and a micro dimension. It turns out that only one course out of ten is brought to completion and leads to a certification. Among such a small percentage of those who endure to complete the course, one out of two lectures/sessions is interrupted within a few minutes (Kim et al., 2014). It has been realized that it is not so simple to require listening to a long recorded lecture. Guo conducted an investigation in order to establish the duration of attention in online learning (Guo et al., 2014). Unsurprisingly, students engaged more with shorter videos. Traditional in-person lectures usually last an hour, but students have much shorter attention spans when watching educational videos online. He aggregated over several million video watching sessions and he found that students quit watching a video after six minutes roughly (median 4.4, for videos of 12-15 minutes). Seaton (Seaton et al., 2014), while studying the access to online resources of three groups of graduate students in an MIT MOOCs, shows that half of the participants watches less than half of the videos and completely skips textual material, text and wiki (still speaking of the 10% students who achieve the certificate). Quite likely, most of the dropouts from MOOCs may be due to an incorrect initial choice, students initiate a course and soon afterwards realize that its content is not the expected one. Still it appears that this is not the only reason for quitting. The distant learner, who commits herself to the initial decision to restart studying, needs to keep her motivation alive, must update the initial choice in the several phases of study, continuing, persisting, resisting to distraction of external type (noise, phone calls...) and of internal type (own thoughts and mind wandering). Our investigation is aimed at describing the context of elaboration and study of blended students dealing with various kinds of learning materials enabling, or not, interaction (webinars, classroom lectures) and control on the pace of the presentations (the recorded resources). Our expectation was that: interactive tools should potentially alleviate the isolation and distance feelings reported by studies on MOOCs. Interactivity may increase engagement and retention of attention on the material and on the lesson. The material under the students' control might have diminished the elaboration difficulties linked the difficulties of concentrating on a single task in a

multitasking environment. We have verified such hypotheses on the basis of the students' answers to our questionnaire. In what follows we shall discuss some of the most relevant emerging consequences.

Method

Subjects

The questionnaire on the motivations of attending the course was completed by 83 students on 97 enrolled. They (26 male students and 57 females) were specialized in several disciplinary fields (36 in the area of Science, 32 in the area of Human Studies, 15 in the area of Music). The full-time employed subjects were 63.

Material

The course PAS (Percorso Abilitante Speciale, special habilitation track) has been performed in a blended modality, with also in-lab group activities. The recorded behaviours, the opinions and the beliefs we shall describe only concern the part of the course regarding the pedagogical content, which was common to students of all areas and consisted of 18 credits. Each of the three blocks forming the whole course (Disability, Evaluation, Teaching technologies) consisted of 10 hours of classroom lecture, plus 15 hours of audio, video material (video lectures, webinars) and texts (by links to written resources, tests, research publications) all of which were available through the University's distance education environment Moodle. Part of the material was administered in synchronous modality (classroom lectures, webinars, labs), but all of it was also available in asynchronous recorded version.

The questionnaire and procedure

The questionnaire was set up starting from the issues arising in the above mentioned research fields (difficulties in lifelong learning, features of the learning resources and effects on attention). It poses questions on the reasons of the initial motivation, information on study collocation (when, where, how long students are able to study), the preferred formats of presentation (see Figure 1). It was asked if, overall, in-presence resources were preferable to those available at a distance, and to explain why. Further, it was asked if distraction occurred with the various forms of materials and to evaluate the adequacy of the time length of the materials. Students were also asked how often they got distracted and by which causes, either external (phone ringing, texting from friends, job call, family call) or internal (worries about work or family). At the end of the course (lasting from March to May 2014), prior to the final exams, the students were invited to fill in the online questionnaire. The invitation was sent by e-mail twice and posted on the Moodle page of the course.

Results

Here we shall report on the motivation issue, on the problem of available time for study, and we shall discuss how long and when students study and wish to study and which are the causes of disturbance.

Study motivation and study time

From the answers to the questionnaire, it turns out that a majority (43 out of 83) of the students attaches very much importance to the course, and other 31 among them care much. Motivation seems to be mostly linked to job needs, to obtain or maintain a position. Cultural interest and refreshing requirements count-less. Among them, 54 feel obliged to do it and 61 believe to put a very high effort in attending it. Further results concern the description of the study context. More precisely: in which place do they study, which periods of time can they devote to study. Since some resources are long, time consuming and consist of complex material, we were concerned with the possibility for the students to achieve adequate concentration and study continuity towards a satisfactory elaboration. From the answers, we obtained that most subjects (60) study at home, a few of them (7) study at home and on the train, or at school (15). Others study wherever they can: in the garden, in the teachers' common room, in the paediatrician waiting room, in a library. Regarding timing, they study in the evening, after dinner, at night, in the weekend, or early in the morning, in the free day, in any spare time or during transfers. They succeed in studying between 30' to 380', with no interruption, the average being 137' and SD 75'. Most of the subjects say they are able to study each day for about 60' to 180'.

What to study – Most preferred and most disliked formats

One section of the questionnaire asked to point out which, among the formats used (lecture, webinar, texts, etc.), were less or most liked. 78 subjects express fully the three preferences, while only 54 of them express three dislikes. In Figure 1 are displayed the preferences of the participants. Among preferred resources, the most interactive emerge: in-presence lectures, live webinars.

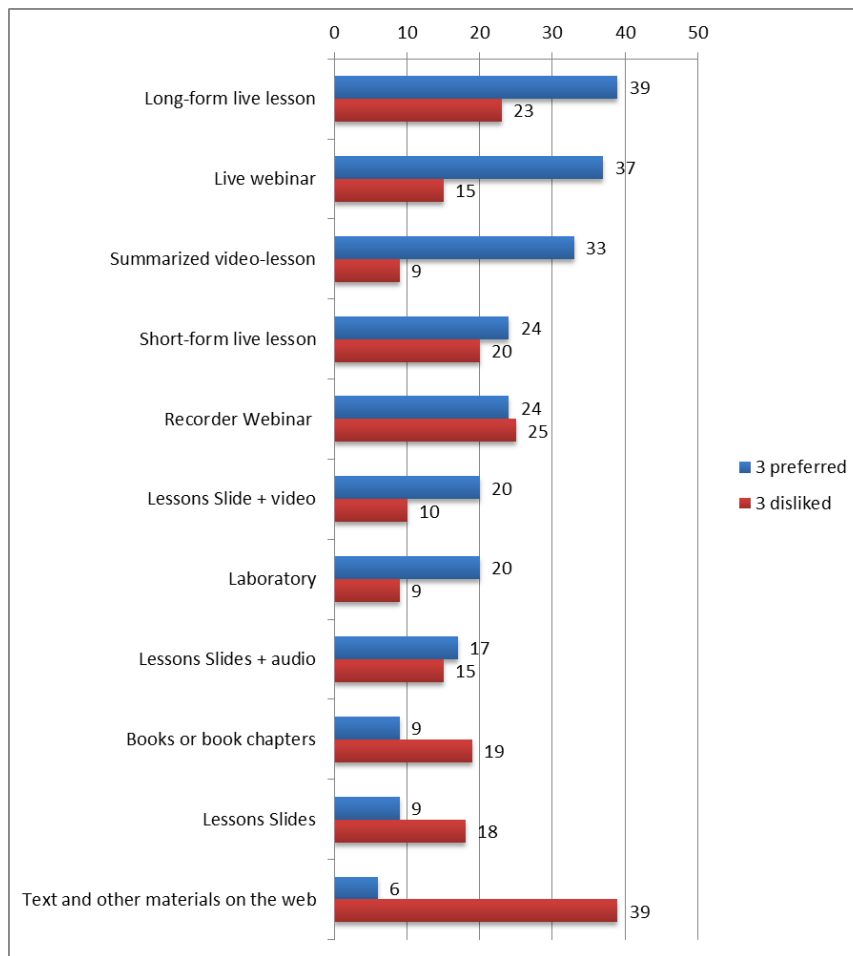


Figure 1. Learning resources: the 3Top preferred learning resources and the 3Top most disliked learning resources

The less liked formats are the material and texts available online, books or books chapters and lecture slides without audio. Such outcomes open the way to further investigation in order to understand in more detail what is not liked. Interviews and focus-groups might be suitable tools for this purpose. A first remark that emerges is that most disliked formats are those that require autonomous elaboration, to be read alone without the organization and planning mediation of the lecturer or the learning designer. Lectures, either in presence or recorded, might be preferred because allow interaction, concentration on the tasks and also because students are helped by a predetermined reading sequencing and by an explicit interpretation, in a narrative format, which does not require to the learner searching and organizing tasks. For the students of this course, who find themselves trapped between the working duties and the study requirements, have a low level of energy and time resources, it can be reasonably inferred that the most preferred materials are those for which the utilization time is predetermined and fixed. This can minimize the extra burden of cognitive resources required for management and organization of working time and the concepts' elaboration. Synchronous usage of resources is markedly preferred: 72 students select at least one synchronous resource among the 3 most preferred, whereas 11 select only material available at a distance. Concerning preference between in-presence and at a distance, 50 participants

prefer in-presence lectures, either short (two academic hours, 90') or long (five academic hours, 300'), 33 prefer those at a distance.

Distraction: External and Internal causes – Do you happen to lose attention?

The majority (44 out of 83) of the subjects states to lose attention often, whereas a significant group (27) gets distracted only sometimes, only 2 subjects claim they never get distracted, 3 always. Distraction accrues independently of the type of resources: it happens while attending to a lecture (especially if recorded), reading texts, attending a webinar, doing lab activities. We asked to evaluate if and how much external and internal causes of distraction provoked loss of concentration in elaboration and study. The proposed distinction, and the examples provided concerned external causes (an event outside of you calls for your attention: the mobile rings, a friend is texting you) and internal causes (something within you drives your attention away: you are worried because you have to prepare a lecture, or to do something for your family). The answers are collected in the following Table 1 and show a complex framework.

Table 11: Internal and External factors of distraction

What are the sources of distractions?						
		Never	Sometimes	Quite often	Often	Always
External factors	Text messages from friends	31	27	14	8	3
	Call from family	10	22	21	20	10
	Call from office/work	14	24	21	13	11
Internal factors	Worries about work	3	8	19	34	19
	Worries about family	3	16	24	27	13

It appears that the only event that hardly leads to loss of concentration is texting from friends, as if it was a regenerating, light escape, profitable for cognitive elaboration. Job and family concerns, either from internal or external stimuli, provoke great loss of concentration. The main trigger to distraction is apprehension rather than environment and social disturbances. It emerges that concern to personal worries is heavily sensed and is the major source of distraction. When asked if external or internal causes of distraction are more frequent, 47 subjects report internal causes, 19 external ones.

Finally we asked about personal feeling occurring when distracted. Tiredness (72 occ.) prevails, often coupled with apprehension (57 occ.). Next come inability to follow the proposed concepts (21 occ.), the feeling of misunderstanding (14 occ). Boredom is mentioned by 14 students, only 5 refer lack of interest. Also in open text answer the pair apprehension/tiredness turns out as the most frequent.

Conclusion

The purpose of this investigation was to provide a preliminary snapshot of the reactions of adult students to a post-graduate course which made use of various types of resources. The data collected concern the effectiveness of the resources as perceived by the students. We investigated their initial motivation, their study habits and preferences, how these fitted with different study resources and difficulties experienced because of internal and external sources of distraction during attendance and study. The results collected by administering an online questionnaire can be summarized as follows. The course structuring has been well received since the opportunity to choose among various combinations of resources was available and also because interaction and alternating between presence and distance were possible. The transfer burden was reduced by allowing (not forcing) in-presence attendance, which is the format preferred by the majority. The availability of recorded material (either used in synchronous modality or retrievable later on) seems to meet the needs and preferences of students. The difference between ideal duration of resources (as indicated by our subjects) and the one resulting from research on on-line courses, MOOCs especially, may appear surprising. While in the latter attention drops resulted after 6', our students indicated as ideal duration 1-2 hours. Explanations may be various and multi-faced. In-presence lecture, as stated by participants, is more involving, it forces and fosters attention and (at least) external disturbances are avoided. A recorded lecture, and asynchronous, allows repeated review of the material. Differences among resources are clearly acknowledged. When asked about ideal duration, the one for in-presence lectures is more extended than the one for lectures at a distance or for video-lectures.

Regarding concentration, students believe to get distracted rather frequently, with all kind of resources and especially by internal factors. Personal worries, tiredness, low attention/distraction, fatigue are the main perceived obstacles. Less disrupting are considered job and family related calls and texting, being sudden and short. Some limitations of the present investigation are acknowledged and may be ascribed to diverse factors. Some of them are expected to be overcome in subsequent stages of this study. We intend to perform interviews, focus-groups, in order to in-depth explore the reasons of the preferences expressed. We also plan to analyze other data we have collected (final performance, motivation/volition strategies) and the results shall be presented in other papers now in preparation.

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TEACHER'S TECHNOLOGY USE AND ATTITUDE TOWARDS E-LEARNING IN HIGHER EDUCATION

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Abstract

Today, teachers are confronted with two big challenges: with the need to learn about new technologies and how to integrate them into the teaching and learning process, and with the need to change course design from content-oriented to active and engaging learning settings. This is not an easy process as teachers are faced with technologies with which the most of them are not familiar. Numerous studies have been dealing with teachers' problems in accepting new technologies, focusing mainly on the how to use technology and only lately on its integration into the teaching and learning process. Studies show that successful implementation of educational technologies depends largely on the attitudes of educators and that their attitude is a major enabling/disabling factor in the adoption of technology (Albirini, 2006; Mahdizadeh et al. 2008; Al-Zaidiyeen et al. 2010; Krishnakumar & Rajesh Kumar, 2011; Babić, 2012).

The research examined, from the perspective of teachers at the University of Zagreb, their attitude towards ICT and e-learning in higher education. The research found that teachers have a positive attitude towards e-learning. Permanent and reliable organized support and promotion of e-learning has contributed to this attitude. Teachers find that ICT and e-learning enable education adjusted to meet the needs of today's students, collaborative learning, better achievement of learning outcomes and knowledge management. A small number of them think that ICT and e-learning merely represent more work for teachers, that they underestimate teachers' role in the education process and that they have no impact on teaching and learning. This confirms that teachers' attitude towards technology influences their perception of the usefulness of technology and how it can be integrated into teaching.

Introduction

The use of ICT to support innovation and lifelong learning for all – A report on progress (EC, 2008), emphasizes that the challenge is to nurture new and innovative learning approaches, to ensure that teachers are aware of their potential and to support them in curricula, teaching guidelines, and teacher training. The Rethinking Education Strategy (EC, 2012) points out that the use of ICT and open educational resources should be scaled-up in all learning contexts and that teachers need to update their own skills by regularly attending trainings. The Report to the European Commission on New modes of learning and teaching in higher

education (EC, 2014) states that the integration of digital technologies and pedagogies should form an integral element of higher education institutions' strategies for teaching and learning and all teaching staff should receive training in relevant digital technologies and pedagogies.

Teachers' attitude towards ICT and computers can greatly influence their adoption and integration of these technologies into their teaching (Albirini, 2006; Al-Zaidiyeen et al., 2010; Buabeng-Andoh, 2012). It cannot be expected that teachers will automatically accept that they need to change their teaching methodology and embrace technology as they have to first understand why technology should be used in teaching and how it can be used to make teaching better.

Among the most important factors in the implementation of e-learning are training and support for the teachers. The institution needs to support teachers, ensure that there is a positive environment and encouragement, organize various types of training, provide the infrastructure and transparently value teachers' efforts and work invested in teaching. In such an environment, teachers will have a more positive attitude towards new teaching methods.

Teacher's Attitude towards e-learning

There have already been some studies on teachers' attitudes towards the ICT and e-learning implementation process in education. Studies show that successful implementation of educational technologies depends largely on the attitudes of educators and that their attitude is a major enabling/disabling factor in the adoption of technology (Albirini, 2006; Mahdizadeh et al., 2008; Al-Zaidiyeen et al., 2010; Krishnakumar & Rajesh Kumar, 2011; Babić, 2012).

In his paper, Buabeng-Andoh (2012) identified personal, institutional and technological factors that influence teachers' adoption and integration of ICT into teaching. Apart from age, gender, educational level and educational experience, personal factors also include ICT competence, experience with ICT for educational purposes and teachers' attitude towards ICT and e-learning.

Support and training

The lack of support and training in new pedagogical methods and technologies can particularly affect teachers who do not feel at ease with computers.

The review of literature shows that teachers' attitudes have been studied more from the technical aspect than from the pedagogical (Mahdizadeh et al., 2008). Teachers who don't see ICT as a potentially relevant teaching tool in their teaching practice are less likely to accept and adapt to technology use. As Cox et al. (1999) stated, if teachers don't see clear and coherent reasons for educational change, what it means and how to proceed, there will be a lot of resistance, confusion and rejection. If they lack necessary information and training they are more likely to have a less positive attitudes towards ICT and e-learning in the educational process, and will assume that it will merely bring them more work (Oldfield, 2010; Krishnakumar & Rajesh Kumar, 2011). Learning to use ICT and e-learning technologies is not

enough. Training in the pedagogical and methodological practice should be provided as well (Oldfield, 2010). Teachers have to learn how to revise their pedagogical practice, how to replace traditional lessons and how to incorporate new education models that place students in the centre of the learning process. Based on this, it can be concluded that teachers' skills and competences are necessary for the adoption of e-learning, especially ICT competence and pedagogical competence. Many teachers fear losing control in the classroom as students gather information about the subject matter from the internet, have better ICT skills than teachers and no longer view teachers as the main and sole experts. Teachers might feel insecure in such situations, and tend to maintain dominance in the classroom by holding onto the existing teaching practice which they find works well and makes them feel comfortable. On the other hand, students can also be the force that drives teachers to start using new technologies in teaching by demanding a better interaction with teachers, accessible and available learning materials and creative ways of teaching.

Study case – The University of Zagreb

The University of Zagreb is the traditional university and the oldest one in Croatia. The University has about 65,000 students and is a large and diversified institution, with 33 faculties that encompass all fields of human knowledge. At the University of Zagreb, some e-learning technologies had been available and used since 1990s, but mostly as individual activities of some teachers or as a technological possibility/necessity at a few faculties. However, the process of systematic implementation of e-learning at the University of Zagreb started in 2007 with the adoption of the E-learning Strategy (University of Zagreb, 2007). The same year, the E-learning Centre at the University of Zagreb University Computing Centre SRCE was established as the focal point for systematic adoption and support to e-learning across the University. One of the first steps of the E-learning Centre was to ensure the constant, sustainable and quality support to teachers and students. The Centre also established and provides the university e-learning platform and e-learning technologies. Today it is the Virtual Learning Environment called Merlin consisting of an e-learning system, a system for webinars, an e-portfolio system and connected with information system of higher education institutions in Croatia. Creating a positive environment, raising awareness of e-learning within the academic community and providing necessary support to users are long term tasks of the E-learning Centre. The E-learning Centre tries to ensure all levels of support the users might need from discussions, consultations, tutoring and trainings in use of technology and in development of learning materials and e-courses. The Centre encourages also the setting of the local support teams at faculties and cooperates with them.

Today the E-learning Centre provides support not only to teachers and students at the University of Zagreb but to teachers and students at other universities and educational institutions in Croatia as well, and it is the only such centre in Croatia.

Research

The research data was collected in 2013 through an on-line survey in which teachers from the University of Zagreb participated on voluntary basis. Four hundred and five (405) participants responded to the invitation to participate in the survey.

Teachers were asked whether there is the e-learning component in any of the courses they teach. The majority of participants (83.0%) replied that the courses they teach include an e-learning component.

Seventeen percent of teachers participating in survey said their courses don't include the e-learning component. As the main reason for that they listed lack of time (47.8%), irrelevance of e-learning to their teaching/subject area and the fact that time and effort invested in e-learning are not valued in their teaching or promotion requirements. Only a small number of teachers (4.3%) said that it is because they don't like technology.

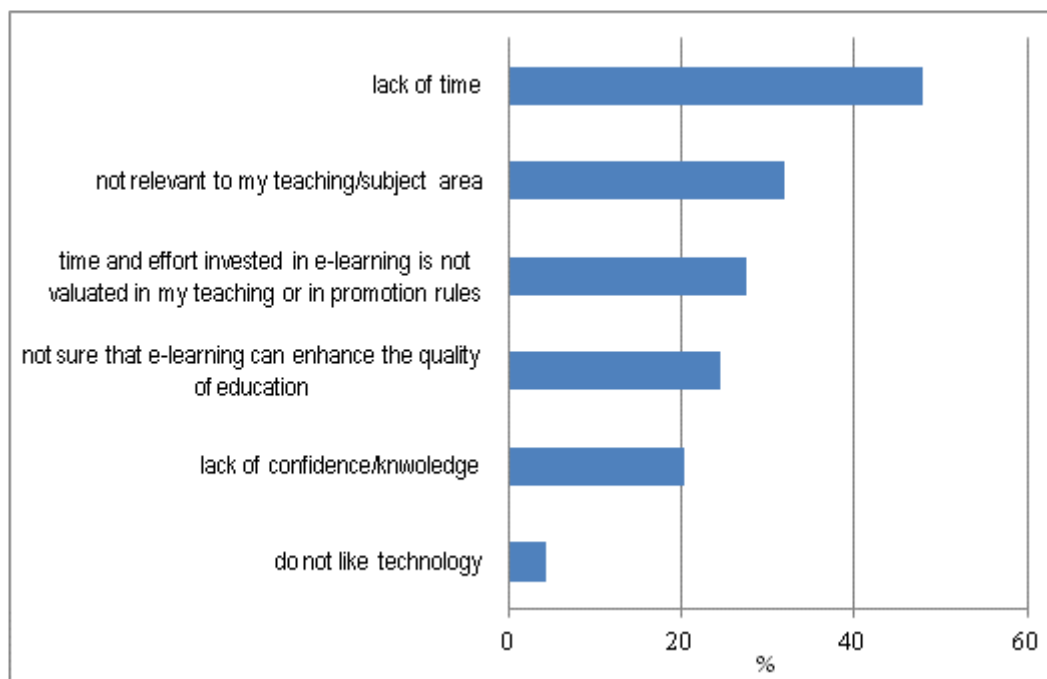


Figure 1. Bar chart showing responses to survey question: "What are your reasons for not using e-learning in your courses?"

The same questions were included in a survey conducted at the University College London-UCL (Voce, 2007). In this survey, as the main reason for not using e-learning, teachers stated that they were unsure of possibilities offered by e-learning, that they don't have time and that e-learning is not relevant to their teaching/subject area. It can be seen that the same answers are present in both surveys. These answers confirm that teachers are preoccupied with their work and that they need training on how to integrate new technologies into their teaching in order to recognize the possibilities new technology can bring.

Teacher's workload is found to be one of the biggest barriers to using new technologies and new methods in teaching (Bates & Poole, 2003; Buabeng-Andoh, 2012). They are already struggling with an overcrowded curriculum, course maintenance, and number of students, while serving as mentors and conducting their own research. Implementing e-learning technologies in the educational process requires significant additional work and time and it should be made part of strategic plans on an institutional level. If this is not done, universities need to be aware that quantity can overpower the quality of teachers' work, which will lead to their poor attitude turning into indifference. Teachers can be enthusiastic and volunteer for some time but if their goodwill and hard work are not recognized and rewarded to some extent, their enthusiasm is not going to last.

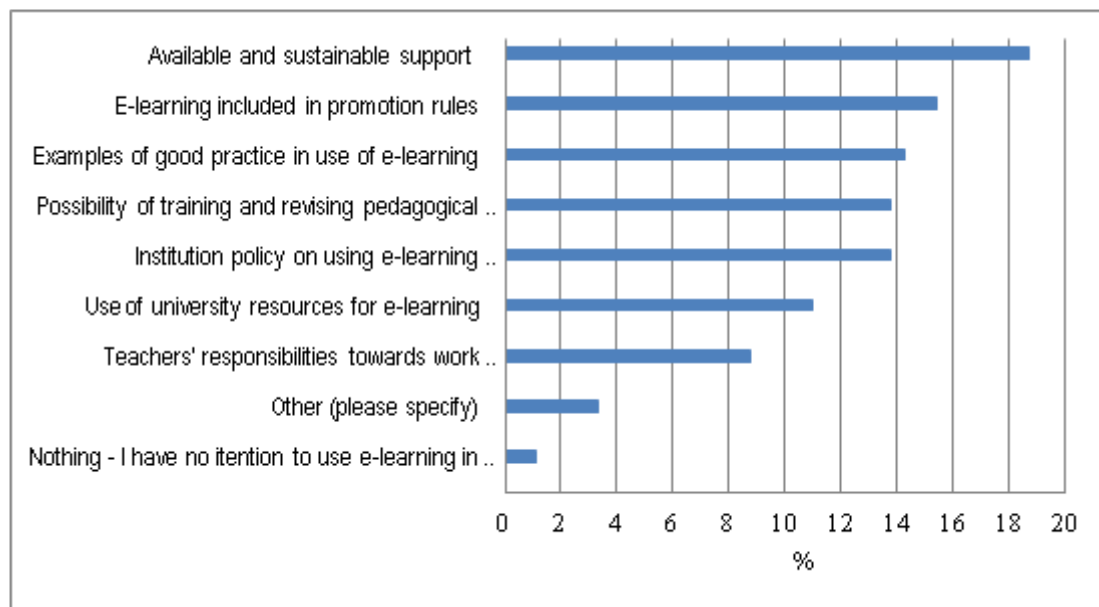


Figure 2. Bar chart showing responses to survey question: "What might encourage you to use e-learning in the future?"

Half of the teachers participating in the survey whose courses don't have the e-learning component said that they would consider using e-learning in the future. To the majority of them the most important factors that would encourage them to use e-learning are:

- available and sustainable support,
- e-learning included in promotion requirements,
- examples of good practice in using e-learning,
- opportunity for training and revising pedagogical practice,
- institutional policy on using e-learning (Figure 2).

Answering the same question in the UCL survey, participants stated that the main factors that would encourage them to use e-learning are:

- more information about e-learning and facilities available,
- more promotion of e-learning,
- good training and support,
- examples of how e-learning is being used,

- incentives and reward for using e-learning,
- more time to investigate and use e-learning (Voce, 2007).

Comparing these answers it can be seen that in both surveys teachers listed the same factors that would encourage them to use e-learning: training and support, examples of good practice and promotion requirements/incentives for using e-learning. Promotion requirements for teachers should be improved, enabling teachers to get promoted in the teaching field as well as in the research field (Bates & Poole, 2003).

Teachers who said their courses have the e-learning component mostly use e-learning as an extension of their classroom courses (65%), or as a blended form of learning (33%), while only 2% teach fully online courses.

In the answer to question: "What impact do you think e-learning has on teaching and learning?" teachers stated that ICT and e-learning:

- enable education adjusted to meet the needs of today's students,
- collaborative learning,
- better achievement of learning outcomes and knowledge management,
- enable access to the online learning materials.

These responses were also reflected in their comments concerning the advantages of e-learning application in the teaching and learning process:

"Better communication, continuous student activity," Senior Assistant, Faculty of Teacher Education

"Time and space independence, better and easier communication, active student participation and interaction," Assistant Professor, Faculty of Science

"Better communication with students, easier to hold exams, material and financial savings and environmental friendliness," Senior Assistant, Faculty of Electrical Engineering and Computing

"New possibilities in the teaching process, new ways to boost student interest, greater availability of learning materials and better control over the teaching and learning process," Assistant Professor, Faculty of Mechanical Engineering and Naval Architecture

"Availability of learning materials, motivation for teachers to improve their learning materials, once prepared materials can be easily modified," Associate Professor, Faculty of Science

"Enables education adjusted to meet the needs of students, enables collaborative learning, encourages students' active participation in the course," Research Assistant, Faculty of Science

“Flexibility of learning in time and space, interesting and dynamic learning, availability of learning material,” Assistant, Faculty of Kinesiology

“Easier communication, better student motivation, improved learning outcomes,” Full Professor, Faculty of Political Science

Nevertheless, around 15% of teachers stated that e-learning only means more work for teachers, some think that it underestimates the teacher's role in the educational process and a few of them think that e-learning has no impact on teaching and learning.

Conclusion

Teachers' attitude has been discussed in many studies and singled out as the most dominating factor for implementing ICT and e-learning into the educational process. It is important to create conditions that will not make teachers feel endangered, that will motivate them to continuously work on “good learning” and in which teachers will receive proper recognition for their work.

Teachers who responded to the survey generally have a positive attitude about ICT and e-learning but not all of them believe that ICT and e-learning can play an important role in improving the quality of the educational process. Teachers often face obstacles when thinking about using ICT and e-learning technologies in their teaching. They don't know which form of technology to use or how to use it and they don't have time to learn as they are already overloaded with work. It is inevitable that all this will impact their acceptance of ICT and e-learning technologies in education.

In this research it has been confirmed that there are factors that influence teachers' attitudes towards ICT and e-learning and their implementation in the educational process. They are more likely to adopt new technologies if they see that technology offers them a better way to do their work and achieve goals. Teachers want available and sustainable support. They need training on new teaching methods, on the pedagogical aspect of integrating new technologies into the teaching and learning process, they want examples of good practice and observation. They need recognition of their effort and clear and transparent rules. Enthusiasm is not enough. They can give their best only if they are assured that changes will make teaching better and more interesting and make students more motivated, so that they feel good about it.

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EXPANDING BLENDED LEARNING SCENARIOS: HOW TO EMPOWER ADULT LEARNERS TO PERSIST?

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Abstract

Blended learning, the seamless integration of online and face-to-face instruction, especially appeals to adult learners. However, it was repeatedly shown that learners' persistence tends to be low in blended environments due to insufficient self-regulation skills. While in search of effective self-regulated learning (SRL) interventions to improve adult learners' retention in blended learning contexts, our systematic review disclosed that scholars can not fall back on a suitable empirical knowledge base. The SRL-persistence relationship is seldom simultaneously addressed, the studied instructional context differs often from blended learning, adult learners are not targeted and/or the empirical approach entails static parameters. In order to expand blended learning scenarios aimed at SRL to improve adult learners' persistence, further scrutiny is necessary. We argue that such research requires not only dynamic and context-related measures of learners' SRL behaviours and persistence but also has to act upon learners' progress through adaptable and timeable SRL interventions.

Introduction

Blended learning is rooted in the online and face-to-face organization of content, activities, assignments, and meetings – “using the web for what it does best and using class time for what it does best” (Osguthorpe & Graham, 2003 p.227). This flexibility especially appeals to adults, who seek out learning opportunities that fit within their work and family responsibilities (Park & Choi, 2009). In spite of their growth, persistence rates tend to be low in blended learning environments (Goeman & Deschacht, 2014). Student persistence or retention refers to completing a learning course or programme, despite the presence of adverse circumstances (Burns, 2013). Studies on learners' persistence often seem to focus on opposing concepts describing early withdrawal from learning programmes such as drop-out or attrition. We emphasize persistence as learners' study continuance that can be positively influenced (McGivney, 2004).

In order to persist in blended learning programmes learners need adequate self-regulation skills (Bannert & Reimann, 2012; Bernard et al., 2014). In this regard, Zimmerman's theoretical framework (2013) on self-regulated learning (SRL) refers to students' observing and monitoring of their thoughts, behaviours and environmental conditions as well as the selection and use of learning strategies. SRL is not an absolute state of functioning but varies

according to personal efforts and context (Zimmerman & Martinez-Pons, 1990). Therefore, this study is concerned with the interaction between formal training and learners' (meta)cognitive, motivational, behavioural and environmental processes (Bell & Kozlowski, 2008) in settings of online and blended learning.

Starting point of the present study was the quest for effective interventions on adult learners' SRL aimed at improving their persistence in blended learning environments. The results would enable us to conceptualize design principles with regard to self-regulation in blended learning contexts (Bernard et al., 2014) and to scrutinize these in follow-up design-based research.

Searching the literature: A systematic review approach

Main objective of the current study is identifying effective interventions on adult learners' SRL which improve adult learners' retention in contexts of blended learning. For this purpose, we carried out a systematic review study. To be included, articles had to:

- be written in English;
- be peer reviewed;
- involve empirical interventions on SRL, in particular experimental designs (Kirk, 1982) that randomly assigned participants to experimental conditions and measured the effect of SRL interventions on persistence/retention;
- target a student population of adult learners;
- be conducted in the context of blended learning.

The concepts of adult learners and blended learning were always incorporated in the search command. In most studies, no direct reference was made to the concept of blended learning. Instead, articles often discussed fully online or technology-enabled learning (e.g. Sitzmann et al., 2008). In order to avoid a major narrowing of search results and partly because it is especially the online space of blended environments that requires SRL (Bernard et al., 2014), these terms and related keywords were also included in our search strategy.

'SRL' was combined with 'persistence' or 'retention' as well as inserted as a single variable, taking into account that studies could include persistence as one of the measured effects and not necessarily as a single research outcome. In order to refer to the act of improving SRL, we based possible verbs (e.g. 'fostering', 'enhancing', 'supporting') on a mid-term review of keywords used by the authors of retrieved studies.

Information retrieval (without date restrictions) was conducted between November 2014 and January 2015 in the databases ERIC, PSYCArticles, Web of Science and EBSCO. These databases were searched using a combination of key terms: "support" / "foster" / "enhance" / "design" / "promote" / "improve" / "help" / "scaffold" / "intervention" AND/OR "self-regulat*" AND "adults" / "adult learners" / "mature learners" AND "blended learning" OR "online learning" OR "technology-delivered instruction" OR "technology-enabled

instruction” OR “web instruction” OR “web-based learning environment” AND/OR “persistence” OR “retention”.

Scope of the literature

Current studies differ from our original problem setting in terms of research context, applied methodology or central concepts. Contextual ambiguities were encountered when adults were just offering assistance to children who were questioned on their use of SRL strategies (e.g. Zimmerman & Martinez-Pons, 1990) and when studies used computer systems solely as a means to conduct experiments without relating to actual online learning environments (e.g. Koriat, Nussinson & Ackerman, 2014).

With respect to methodology, search results returned correlational survey studies relating demographics to SRL ability (e.g. Zhao, Chen & Panda, 2014) or descriptive case studies (e.g. Idan et al., 2011).

Some studies reported SRL interventions exclusively aimed at SRL per se, such as effects of reflection prompts on SRL (van den Boom et al., 2004). Moreover, when SRL interventions were aimed at learning outcomes, the measured effects often differed from persistence/retention. In particular, the relationship between SRL and performance prevails (e.g. Rowe & Rafferty, 2013). Sitzmann, in collaboration with Ely (2010) and Johnson (2012) introduced SRL interventions to examine the effects on both performance and attrition, opposed to the concept of persistence/retention. Attrition was lowest when reflective questioning was prompted throughout the learning process (2010) and when trainees followed through on the plan to devote substantial time to training (2012).

Running the above screening process, two studies were retained where persistence was included as a learning effect among a larger set of learning outcomes. In the first study by Kramarski and Michalsky (2009) 194 first-year pre-service teachers were randomly assigned to one of four instructional methods: e-learning (EL) or face-to-face (F2F) learning, whether or not supported by SRL instruction. Experimental groups were trained in the importance of SRL and a metacognitive self-questioning method. Subsequently, they received self-questioning before each practice of pedagogical skills, prompting them to reflect. Experimental pre-service teachers in the e-learning condition reported higher persistence in learning, compared to the F2F and control group. In the second study, Hu and Driscoll (2013) examined the influence of a web-based SRL strategy training on the achievement, motivation and self-reported strategy use of 21 undergraduate students. Similar to the first study, the intervention consisted of a training and prompting part. First, students received an online tutorial and exercises on what, when and how to use SRL strategies. Afterwards, they were encouraged to apply the strategies throughout the course, completing a series of interactive online questionnaires. Learners who received training in SRL and were prompted to reflect on their strategy use, had a higher tendency to persist compared to the control condition.

In short, current literature seldom simultaneously addresses the SRL-persistence relationship in the instructional context of blended learning and adult education. The retained studies by Kramarski and Michalsky (2009) and Hu and Driscoll (2013) did cover this problem setting but are open to methodological improvement. Therefore, before we can build on current SRL intervention guidelines aimed at improving adult learners' persistence in blended environments, these are the very foundations that require further reflection.

Methodological issues

Applied SRL and persistence measurements in both Kramarski and Michalsky (2009) and Hu and Driscoll (2013), have shortcomings in terms of objectivity, fitting in with the learning context and the ability to capture and act upon the dynamics of the learning process.

With respect to the measurement of SRL, both studies adapted the Motivational Strategies for Learning Questionnaire (MSLQ) by Pintrich, Smith, Garcia and McKeachie (1991), a prevailing tool for assessing SRL (Saks & Leijen, 2014). However, self-report measurements have been criticized for failing to register students' actual strategy use as they rely on biased long term memory or are likely to incite socially desirable answers (Hughes, 2013).

Moreover, since the MSLQ was designed to measure SRL strategies in face-to-face classrooms, it may become invalid in online learning settings. While the Online Self-Regulated Learning Questionnaire (OSLQ) was presented as a measurement of SRL strategies in wholly or partially web-based environments, it does not contain items on motivation and therefore falls short as an alternative to the MSLQ (Barnard et al., 2009; Goda, 2012).

By using the MSLQ, both studies only measured SRL as an aptitude or trait, generalizing student actions across learning situations. However, given the domain specific nature of SRL behaviour, analyzing self-regulatory traits also makes assumptions about self-regulatory states (Leidinger & Perels, 2012). Since "there is no general ability without reference to the environment" it is desirable that the specific learning event students are experiencing, is taken into account (Beck & Breuer, 2004, p.8). Furthermore, SRL is a continuous process (Sitzmann et al., 2008). However, both studies applied a pre- and post-test measurement which fails to seize the changes in students' SRL throughout the learning process. In this context, Winne and Perry's (2005) process models advocate the assessment of students' SRL over time, through for instance think-aloud protocols.

When turning to the concept of persistence, both studies applied a different measurement approach. Kramarski and Michalsky (2009) did not address persistence as a stand-alone measure but extracted a motivational construct from the MSLQ. By contrast, Hu and Driscoll (2013) obtained data on students' learning achievement from the course instructor. Next to questionnaires (e.g. Lee & Choi, 2013) and administrative student records (e.g. Dirkx & Jha, 1994), persistence measurements also rely on the online tracking of activity trends (e.g. Morris, Finnegan & Wu, 2005). Although these studies measure persistence in a variety of ways, they share a static approach towards the concept, only registering persistence rates without acting to improve retention.

When we consider the intervention design of Kramarski and Michalsky (2009) and Hu and Driscoll (2013), we note that the timing and content of SRL training and prompts were part of a pre-fixed outline. Although this area of concern was not empirically addressed, authors of both studies acknowledge the need to observe and monitor learning processes – be it with respect to providing adapted support to learners with varying levels of SRL (Kramarski & Michalsky, 2009) or to “data-mining for more individualized SRL guidance and more effective control for study drop-out to cultivate more 21st century competent e-learning completers” (Hu & Driscoll, 2013, p.180).

Conclusion

The present study focused on identifying interventions on adult learners’ SRL aimed at improving their persistence in blended learning environments. However, the systematic literature review revealed a lack of relevant empirical evidence. The SRL-persistence relationship is seldom simultaneously addressed, the studied instructional context differs often from blended learning or adult learners are not targeted. Moreover, the empirical approaches entail static parameters and focus mainly on university education and single (online) courses.

In order to know *how to* expand blended learning scenarios in terms of strengthening adult learners’ SRL so that their persistence will improve, further scrutiny is necessary. Such research requires not only dynamic and context-related measures of learners’ SRL behaviours and persistence but also has to act upon learners’ progress through adaptable and timeable SRL interventions.

Departing from this problem setting, our future research aims i) to identify the particular points in time when students’ persistence is significantly challenged and ii) to define which SRL interventions, either online or face-to-face, could be implemented within a blended learning programme. This follow-up research will be carried out in close cooperation with several Adult Education Centres throughout different regions in Belgium. Ultimate aim is to find solutions for increasing participation in lifelong learning, one of the key issues in the European 2020 policy framework (European Commission, 2013).

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USER PERCEPTIONS ON RELEVANCE OF A LEARNING MANAGEMENT SYSTEM: AN EVALUATION OF BEHAVIOURAL INTENTION AND USAGE OF SCIPRO SYSTEM AT UNIVERSITY OF RWANDA

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Abstract

With the emerging use of technological interventions in education systems, e-learning systems contribute immensely in education delivery. However, with substantial efforts from the Rwandan Government, there are still claims about the lack of online support systems especially for thesis process in Rwandan higher education. Furthermore, the experience has proved that some systems implemented at University of Rwanda have failed because the adoption is loath. Therefore, one of the reasons is that some innovative systems are fully diffused and deployed in the university without prior test to its future users to know the user behavioural intention from their perceptions in regard to a particular system. This study follows the introduction of one learning management system called “SciPro” and the aim of this study was to evaluate the future key users’ perceptions about the relevance of SciPro System in improving thesis process. Embedded Case study was used as a research strategy to collect data from 31 workshop participants using a questionnaire. Afterwards, convenient interviews were conducted at 5 colleges during and after testing some features and functionalities of SciPro System. Results show that future users express a reasonable level of intention and use of the system. They also appreciate the usefulness of SciPro resources at a higher level. Thus, on the other hand, one concludes that proposed customization of SciPro in accordance to Rwandan education system should be considered for some features such as peer review process and anti-plagiarism control functionalities. The study also reveals that there are other factors outside SciPro System, such as, management support, high-speed Internet access and motivation to innovators and early adopters that should be considered throughout the implementation process.

Introduction

Since the introduction of computer in everyday human life, there has been a dramatic change in the way activities are performed and the education sector has not escaped this phenomenon. Through the use of Internet and related technology, a wide range of learning management systems have been developed and according to Alkhatabi, Neagu and Cullen (2010), this trend has improved the teaching and learning activities in several higher learning institutions especially from developed countries. But the adoption and use of these innovative technologies depend mainly on the user behavioural intention, which is delivered by different expectations in regard to system resources and functionalities. Researchers such as Hansson et al. (2009) and Alexander (2001) have elucidated the role of information and communication technology (ICT) to improve the quality of education. Once implemented successfully and accepted by users, ICTs impact on the way online educational activities, such as thesis supervision process, are performed and on the quality of final submitted theses by both bachelor and master's students. A research by Archer, Garrison and Anderson (1999) reveals that the emergence of E-learning technologies intensely transformed traditional education systems in a disruptive way. ICT in education involves digital learning and this brings cohesiveness by removing barriers to both on campus and on distance learners. Furthermore, Anderson (2008) explored prior studies on E-learning technologies and summarized some of the associated benefits which include the increased access, removal of time, place and barriers, ability to provide just-in time learning, cost effectiveness, increased interaction, provision of future employment skills for learners, greater accountability and effective support for lifelong learning.

Although some universities recognize those advantages, there is still a noticeable lack of strong E-learning technologies in a number of universities from developing countries and particularly in Rwanda. Claims also go further by positing that some IT systems implemented some years ago have not attended envisioned objectives. This can be evidenced by claims from the academic community and the rest of Rwandan society that there is, for example a poor quality of theses produced by bachelor and master's students while as per the national mandate, research outcomes should improve people's lives. Various reasons for this phenomenon could be like the lack of easy access to some resources for students and supervisors, scarce time for supervision, high supervisor-student ratio and lack of anti-plagiarism systems among others.

From this perspective and with the aim to improve quality of education, different IT systems are implemented to support teachers, students and the rest of the academic community regardless of the education discipline. These IT systems, once well implemented, accepted and understood by users, they can assist universities to achieve their educational visions and aims. Coming back to the point of designed systems for supporting learning and teaching, Cohen and Nachmias (2011) stressed that though there is still a challenge to e-learning environments, but there are still innovative technologies coming up to improve communication and resource sharing to harmonize teaching and learning activities.

One of the technologies enhanced learning enabled by the fast technological developments is the online supervision system designed to help the academic community in producing quality theses at both undergraduate and postgraduate levels. With this technological innovation in thesis process, higher learning institutions such as Stockholm University's Department of Computer and Systems Science, DSV (Hansson, Collin, Larsson & Wettergren, 2010) for example, are currently using that system to enjoy benefits like collaborative learning, research information exchange with the rest of the society (industry, business, government and NGOs) and quality produced theses. This system improves access to e-resources and other learning materials, and increase flexibility by allowing students and supervisors to communicate anytime at any place thereby enabling self-paced and lifelong learning.

Nevertheless, it is worth to note that the degree of a particular artifact usage normally depends on the level of users' familiarity and how easy it is to use. This conceptual viewpoint is also supported by (Cowen, 2009; Davis, 1993; Jonscher, 1983) who contend that user attitude and acceptance of an IT system is an essential factor to gain productivity in a shorter time and with no additional financial investment. This assertion brings us to the point that universities should evaluate students and teachers' perceptions about the usefulness of a particular e-learning system before embarking on its full implementation. This being the case, it will lead to the system adoption, which as result improves work performance and effectiveness to add value to the overall university productivity.

Although there are various computer-supported learning systems to improve thesis supervision, the University of Rwanda has shown an interest to implement SciPro System in its new colleges to of help staff and students in different research activities. Prior to that, experience has proven that some systems implemented at this university to support e-learning activities have failed because users didn't use them effectively as intended by the university management. Therefore, with the aim of avoiding such phenomenon for SciPro system, the later is being tested to some teachers and e-learning coordinators to determine their behaviour intentions that lead to adoption and use and the associated value addition in improving thesis supervision process.

The empirical researches such as of (Hardrave & Johonson, 2003; Schewe, 1976; Venkatesh, Morris, Sykes & Ackerman, 2004; Chau, 2001; Kacmar, Fiorito & Carey, 2009) maintain that, in order to avoid rejection of new introduced IT systems, it is advisable to strategize by predicting user acceptance of an artifact before full implementation and usage. From the university point of view, Jan and Conteras (2011) state that there is a strong need to identify variables that influence technology acceptance and adoption. Within the same context, Rogers (1995) maintains that the innovation adoption level is not the same but it is useless to push all people to adopt it at the same time but rather start with innovators and early adopters as shown in the figure below:

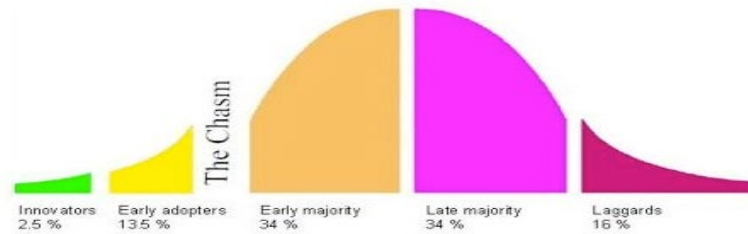


Figure 1. Innovation adoption lifecycle (Roger, 2005)

The research is emerging in the areas of adoption and usefulness of technology platforms in education sector (Park, 2009; Taher, 2012; Keller & Cernerud, 2002; Yuen, Fox, Sun & Deng, 2009), and on online thesis supervision in particular (Hallberg, Hansson, Moberg & Hewagamage, 2011; Hansson, Collin, Larsson & Wettergren, 2010). However, there is still lack of knowledge on behaviour intention and use of an online supervision system from teacher perspective in developing country from a new university setting.

The aim of this study is to determine behavioural intentions and usage of teachers and e-learning coordinators from University of Rwanda on SciPro System. To achieve this, participants' perceptions about this system are evaluated to identify the degree of importance of SciPro System resources and to assess the overall system usefulness in improving thesis supervision process at University of Rwanda.

Theoretical framework

Today, research in applied technology has noticed a fast growing rate of debates about innovation diffusion, system adoption, behavioural intention and user acceptance to use technology (Fishbein & Ajzen, 1975; Venkatesh et al., 2004; Davis, Bagozzi & Warshaw, 1989). An individual behaviour on adopting a technology depends normally on the level of expectancy toward using a particular artifact. Therefore, people may express different behaviours as they have different expectancies to an innovation. Thus, according to Roger (1995), an innovation in society may be simply an idea or an artifact made to improve a specific current process. The introduction of a new technology may result in adoption or rejection (Keller, 2005; Roger, 1995) and the user behaviour intervene in either of these tendencies. From this notion, in the education sector, students and teachers can have different expectations on a learning management system and at the same time the adoption and use of this system may be affected by other internal or external factors such as the social influence, the system's facilities and the organizational culture, structure and policies.

There are eventually a number of models, theories and frameworks that have been developed to assist researchers in predicting the user behaviour intention, the adoption and use of new systems and its usefulness. (Davis, 1993; Davis, Bagozzi & Warshaw, 1989; Roger, 1995; Venkantesh et al., 2004). Several researchers also used some of these models to evaluate the integration of e-learning systems (Keller, 2005; Chen, 2011; Xie, 2006; Straub, 2009; Gruzdl, Staves & Wilk, 2012; Park, 2009).

In educational technology research for example, the Unified Theory of Acceptance and Technology (UTAUT) record the highest and noteworthy level (70%) of accuracy in predicting user acceptance of technology as compared to previous related models (Moran, Hawkes & El Gayar, 2010; Wang, Wu & Wang, 2009; Park, 2009). This model is mainly composed of four independent variables retrieved from previous related models and theories: Performance Expectancy, Effort Expectancy, Social Influence and Facilitating Conditions (Venkatesh et al. 2004). This is considered as a new updated model as it also consider other four control variables of Gender, Age, Experience and Voluntariness. On top of these mentioned constructs, the UTAUT model is also made of behaviour intention and use behaviour as dependent variables.

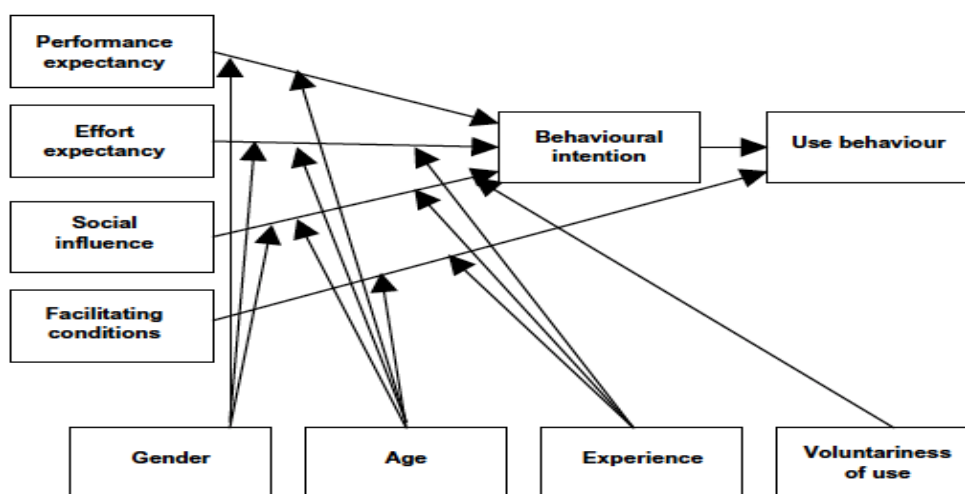


Figure 2. Unified theory of acceptance and use of technology model (Venkatesh et al., 2004)

The performance expectancy dimension is defined, as the extent to which someone believes that using a system will contribute to his/her job performance. This concept is considered as the convincing forecaster of the user's behaviour intention as compared with other constructs. The effort expectancy is defined as how effortless it is to use a system. This effortless is in deemed to be associated with the gender, age and experience of an individual. The third construct is the social influence, which is defined as a situation whereby the intention to use a technology by an individual is subjective to other important people around. The fourth independent construct is the facilitating conditions, which is defined as the extent to which a person believes that the organization and its technical infrastructure are there to support in using a particular artifact. The particularity of this construct is that it will not directly affect the behaviour intention in regard to a system but instead to the use behaviour.

Because SciPro is an online thesis supervision system, which is an Information System, its resources should reflect user expectations in order to be adopted and used effectively. If this is not the case, then it will be useless at university of Rwanda. Nonetheless, within the context of this study, UTAUT is used in the sense that the levels of perceptions from supervisors at University of Rwanda on SciPro system are used to determine the behavioural intentions and usage derived from related system features.

Overview of SciPro System

The scientific process system (SciPro) was first conceptually developed in 2006 at the Department of Computer and Systems Science, DSV, Stockholm University (Hansson & Momberg, 2011). Its implementation process started in 2010 at the same department and up to now, more features and modules are being incorporated with the main purpose of supporting thesis writing and supervision process for bachelor's, master's and PhD students. The general concept in SciPro system is about meta-coaching which encourage and support online self-learning through automated information technology platforms. The way SciPro system is built allows asynchronous and synchronous communication and access to online materials needed for different research undertakings.

According to Hansson, Momberg and Peiris (2012), the SciPro System is designed with a possibility to match different ideas from supervisors, students and the rest of the community via an Idea Bank. The later facilitate the matching of students' thesis topics with the current research activities at university and the industry and this is an opportunity to select those relevant research ideas that provide solutions to society needs. The Idea Bank can be described a research ideas management system that receives pools of ideas from students, supervisors, research funders, business society and governments and matches them to according to teachers' expertise and knowledge.

So far, with the continuous development of new modules of the system, SciPro has now been integrated with "Turnitin" an anti-plagiarism control system. This aspect of anti-plagiarism has prevented students to opt for copying other's work and encourages them to be creative and be creative in research. This is because they are now aware that SciPro System will not allow this scientific dishonest. With this new innovation, it is now easy for supervisors and students to examine plagiarized texts and this has improved the quality of theses published at DSV.

After getting information on the features and capabilities of SciPro system in supporting thesis production process, the University of Rwanda has been interested in implementing it in its six colleges in order to improve research activities in Rwandan public higher learning. It is in this framework, that a pilot study is conducted to evaluate future user perceptions and views of participants (teachers, system e-learning coordinators) and the senior management of the university on how they perceive this system.

Methodology

Data Collection

Participants in this research were selected via the centre of instructional technology (CIT) of the University of Rwanda and they were invited for the introduction and testing of SciPro System as a new technology in thesis supervision process. The research used an embedded case study with multiple units of analysis (Yin, 2003; Denscombe, 2010) by considering five of

the six colleges of the university. Afterwards, at each end of workshop session, questionnaires were distributed to participants to collect quantitative data.

Additional information about the adoption and use of SciPro System at University of Rwanda has been collected through unstructured face-to-face interviews and a researcher conveniently contacted respondents during and after the workshop. Interviewed participants discussed voluntarily and reflected about the new introduced system. Through these interviews, views and expectations on SciPro system were also collected and used for further analysis of the study results.

Data analysis

Regarding the type and environment of this study, a conceptual model of SciPro System adoption and use was developed to guide the researcher. The model is to be referred to when trying to investigate different variables and determinants of user perceptions on SciPro System resources, with reference to the UTAUT model. Afterwards, four independent variables of UTAUT model are used to accommodate all thirteen SciPro resources mentioned above: Performance Expectancy (PE), Effort Expectancy (EE), Social Influence (SI) and Facilitating Conditions (FC). Thereafter, this will predict the behaviour intention and use behaviour when the system will be fully implemented. The figure below shows the conceptual model for SciPro System resources in regard to main constructs of UTAUT Model.

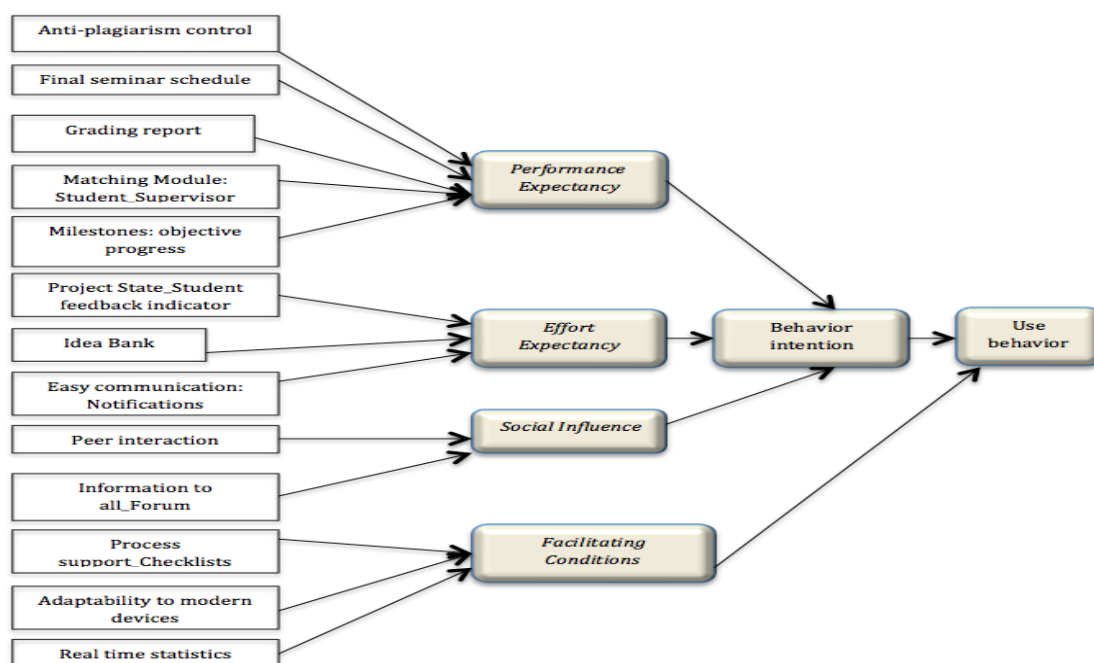


Figure 3. A conceptual model for SciPro system resources in UTAUT model

As per the figure above, the performance expectancy dimension includes five resources: Anti-plagiarism control, Final seminar schedule, Grading Report, Matching Module: Student_Supervisor and Milestones: Objective progress. The second dimension which is Effort expectancy includes Project state: Student feedback indicator, Idea bank and Easy

Communications: Notifications. The third dimension of UTAUT Model is Social Influence and it includes only Peer interaction and Thesis information to all. The last three resources of SciPro System that included in the fourth dimension of facilitating conditions are: Process support-checklists, Adaptability to modern devices and Real time statistics.

Hence, from this figure, the related mean from descriptive statistics were analyzed and reported to each dimension of UTAUT model in order to determine the overall intention behaviour and use of SciPro system at University of Rwanda from the user perception. Afterwards, the behaviour intention of supervisors was determined by calculating the average mean of the first three dimensions of the UTAUT model (PE, EE and SI). After that the use behaviour (UB) was obtained by considering the mean of behaviour intention (BI) and facilitating conditions (FC).

Results

This study was carried out at University of Rwanda from June to October 2014 during the starting point of SciPro test and implementation to improve the thesis supervision process. The population was composed of teachers (64.5%) and e-learning coordinators (35.5%) with the experience in academic institution ranging from 2 to 22 years. Both categories are involved in the supervision of both bachelor and master's research projects and they are from 5 of the 6 colleges of the recently created University of Rwanda.

In order to answer to the research question, mainly quantitative data were collected and analysed. In addition to that, qualitative information was also collected in order to back up quantitative information and enrich data interpretation. Hence, unstructured interviews have been conducted with five participants in SciPro test and each interview took on average 12 to 15 minutes. In general, the following data were collected, analysed and interpreted to get relevant answer to the research question.

Perceptions about the degree of importance to SciPro Resources

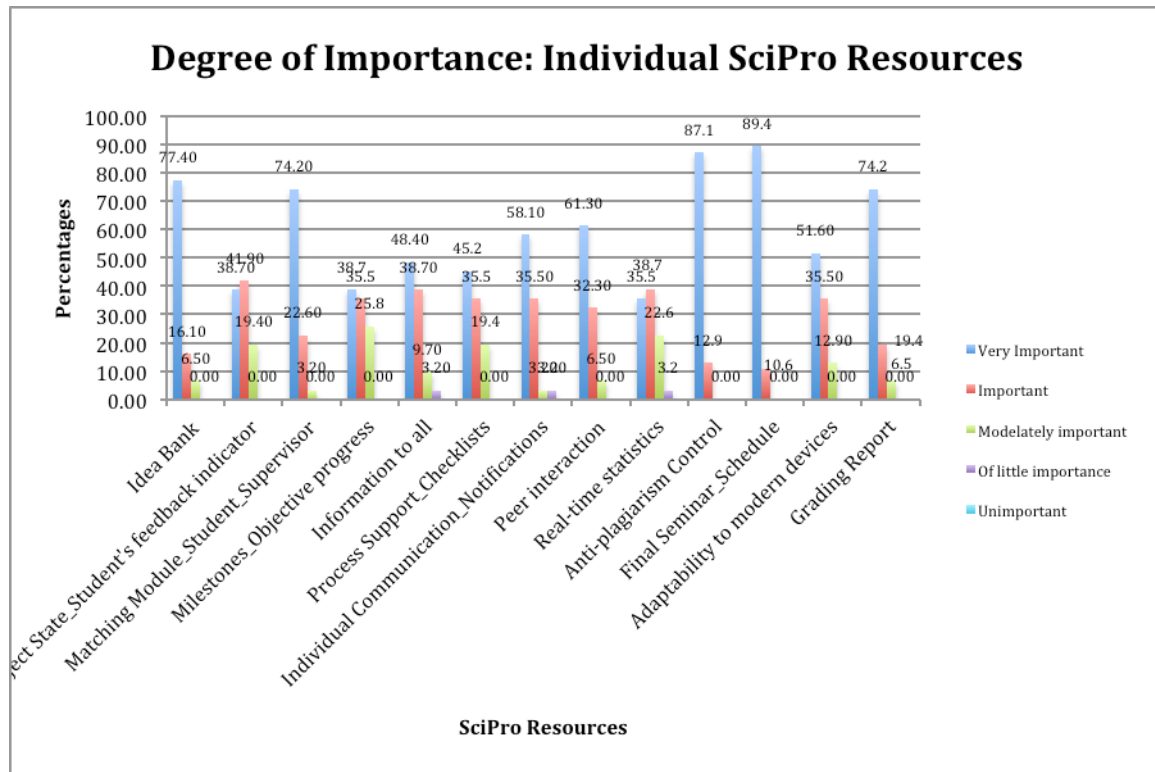


Figure 4. Degree of importance to SciPro System resources

From the table below, the study, first was interested to know the perceptions of participants on the importance of SciPro Resources. After that, these data were incorporated in four independent dimensions of UTAUT model, which is implied for this research. With these data, a researcher has proceeded on determining the mean of the degree of importance from each of the UTAUT dimension considered for this research. The table below shows these data in a detailed way:

Table 1: Grouping SciPro resources in regard to independent variables of UTAUT Model

UTAUT Dimensions	Very high	High	Moderate	Low	Very low
Mean Performance Expectancy	72,72	20,2	7,1	0	0
Anti-plagiarism control	87,1	12,9	0	0	0
Final seminar schedule	89,4	10,6	0	0	0
Grading report	74,2	19,4	6,5	0	0
Matching Module:Student_Supervisor	74,2	22,6	3,2	0	0
Milestones_objective progress	38,7	35,5	25,8	0	0
Mean Effort Expectancy	58,07	31,17	9,70	1,07	0,00
Project State_Student feedback indicator	38,7	41,9	19,4	0	0
Idea Bank	77,4	16,1	6,5	0	0
Easy communication: Notifications	58,1	35,5	3,2	3,2	0
Mean Social Influence	54,85	35,5	8,1	1,6	0
Peer interaction	61,3	32,3	6,5	0	0
Information to all Forum	48,4	38,7	9,7	3,2	0
Mean Facilitating Condition	48,4	35,5	16,15	0	0
Process support_Checklists	45,2	35,5	19,4	0	0
Adaptability to modern devices	51,6	35,5	12,9	0	0
Real time statistics	38,7	35,5	22,6	3,2	0

User Perceptions on Relevance of a Learning Management System: An Evaluation of Behavioural Intention and Usage of SciPro System at University of Rwanda

Jean Claude Byungura et al.

By using the data from the table above a researcher has determined the mean for each of the UTAUT independents variables according to the teacher perceptions regarding SciPro Resources. The chart below provides clearly the details:

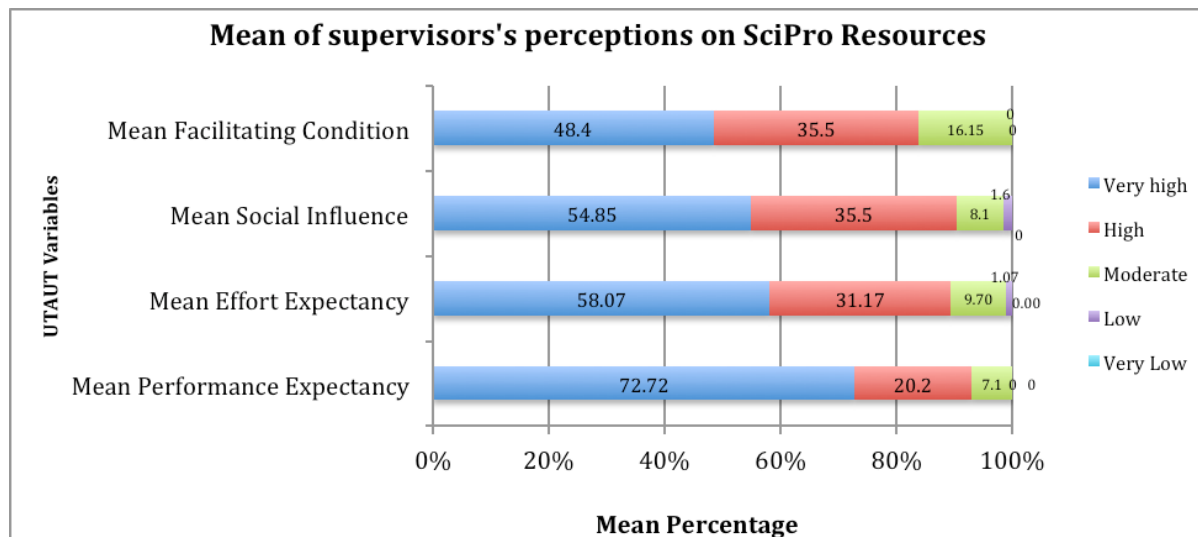


Figure 5. Perceptions about the degree of importance of SciPro Resources

As it can be observed from the table above, participants in the SciPro system test at University of Rwanda believe that the system will increase performance at the degree (92.74%) totalling the very high and high means. They also perceive the system as effortless to use with the degree of (89.24%). The social influence to using the SciPro System resources accounted for a high and very high degree of (90.35%) while the facilitating conditions are averaged to the level of high and very high (83.9%). All the UTAUT variables used to measure the supervisors' perceptions have recorded moderate views at 7.1%, 9.70%, 8.1% and 16.15% respectively.

But on the other side, this will depend on if other conditions outside the system are fulfilled. That is the reason why the information from this figure is not enough to confirm this assertion on the future use of this SciPro system at University of Rwanda. The reason is that some respondents posit that other external should be taken into consideration. Interviewed participants expressed some of the key factors such as ICT infrastructure in place, a clear E-learning Policy and motivation from the top management that should be considered to ensure success integration of SciPro System. One respondent, for example, has to explain the following:

".....what I am well aware about is that, even before the merging of our former universities, there have been other systems that failed not because they are not good, but you know.... Just because there is no clear e-learning Policy and ICT policy in place."

Discussion

The main purpose of this research was to evaluate user perceptions on the SciPro System which in the early stage of implementation at University of Rwanda. Expected users of this system include final year students writing on their research projects, teachers, e-learning coordinators and the management of the university. This research was interested only on teachers who are involved in supervision of students' research projects but also E-learning staff participated because they can play a crucial role in one way or another during system testing and implementation process.

By answering to the main research question, results reveal that participants in system test perceive that SciPro System intend to embrace and use the system for thesis supervision process at University of Rwanda. This has been proved by the reasonable percentages showing the degree of behavioural intention (90.78%) to usage calculated using data from supervisors regarding their perceptions in regard to SciPro resources. This can be more illustrated by the figures below:

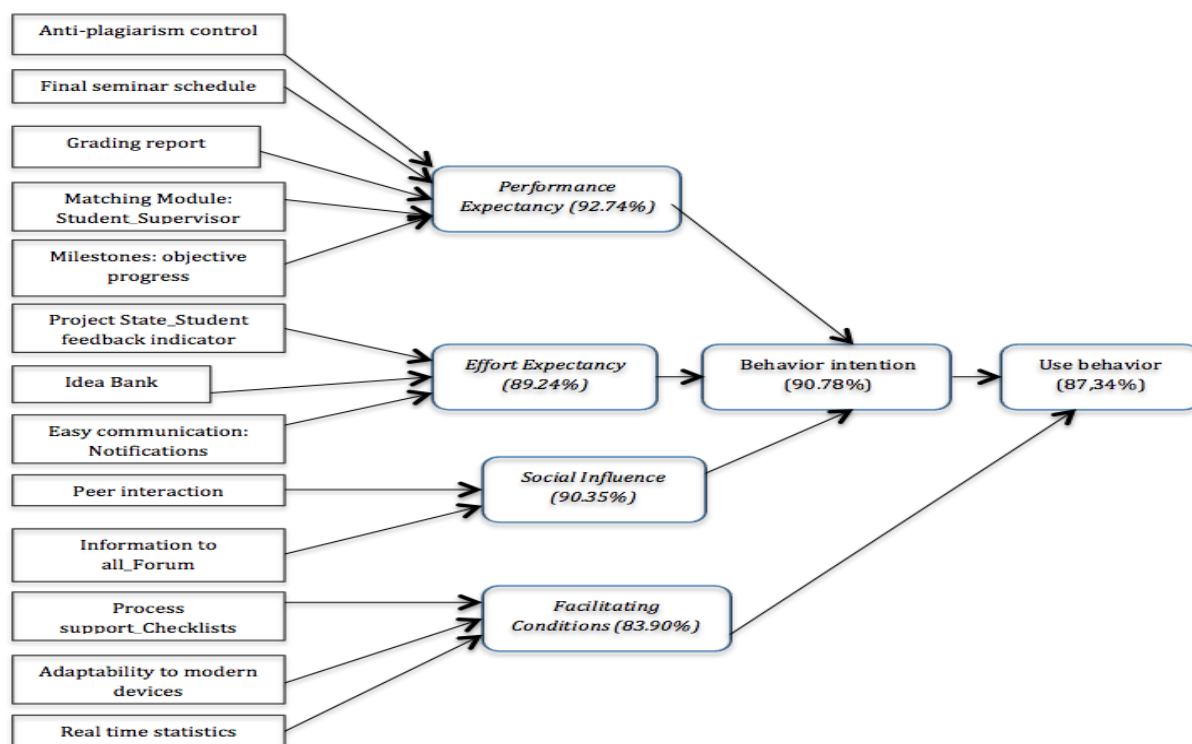


Figure 6. Supervisors' perceptions regarding SciPro System resources in UTAUT model

As it can be seen in the figure above, the degree of behaviour intention accounts for (90.78%), which is obtained from the mean of three dimensions of PE (92.74%), EE (89.24) and SI (90.35%). The degree of use behaviour is also estimated at (87.34%), which is the mean of BI (90.78%) and FC (83.90%).

On the other hand, information from interviews conducted during SciPro System Test reveals that to ensure successful implementation and usage of the SciPro system, there are other factors outside the SciPro resources that should be considered. Those are like the full management engagement and support, extrinsic motivation to those early adopters of the system and Internet accessibility for students and supervisors, system customization to fit in the university culture and practice.

Conclusion

This study explored supervisors' perceptions and determined the degree of behaviour intention and usage of the SciPro System at University of Rwanda. Results shows that the behaviour intention, which is high (90.78%) will have a direct impact to the usage behaviour (83.78%) if other facilitating conditions on SciPro itself (83.90%) and other external conditions discussed are fulfilled.

Furthermore, on top of developing a clear e-learning policy to support the implementation process, those people with high interest should be motivated by just recognizing their efforts in using such a new system to improve the quality of research at university. One interviewee (from the extract below) stated that recognition could be like to include this effort in their annual performance evaluation report and in their normal teaching workload.

"... I always get involved in E-learning systems adoption here, and to be honest I have been interested in this one because it is about research supervision. Students do plagiarize here and I want a system to check this, ... but how am I recognized by the leaders of this university? Is there any policy for motivating those who use it? I don't think there is ... and even those who don't use these new systems, no one asks them why! I think there is a need recognize this because sometimes these systems are expensive for our university and finally they are not productive. The same case happens for MIS."

With reference to the model of Rogers (1995) about the innovation adoption lifecycle, and on the fact that people are different in terms of technology adoption, a researcher recommends that the University of Rwanda should not consider all the trained teachers to adopt SciPro System. Conversely, from the test process, early adopters who showed a high interest in using the system should be followed up and be assisted as much as possible to use the system and later on others will come on board.

On SciPro System point of view, it has been advised to customize it to the university current thesis process especially some features such as peer review process and anti-plagiarism control functionalities.

One could also conclude that this study was just focusing on supervisor perception on the system. Therefore, further studies should extend this research on student perspective and the university management. In addition to that, there is a need also to research on other factors

outside SciPro system such as the university culture on adopting innovation, existing policies and regulations of the university, the existing basic ICT infrastructure and other UTAUT independent variables such as gender, age, experience and level of voluntariness from future users of this supervision system.

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EXPLORING CAUSAL RELATIONSHIPS AMONG TEACHING, COGNITIVE AND SOCIAL PRESENCE IN INTERNATIONAL COLLABORATIVE SEMINARS: INITIAL FINDINGS USING THE COMMUNITY OF INQUIRY SURVEY

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Abstract

This paper discusses the causal relationships among the three presences in the Community of Inquiry (CoI) framework that has been used extensively in the research and practice of online and blended learning. Relations among social, cognitive and teaching presence were explored in the context of a series of course redesign experiments (2012-2014) in higher education. The redesign experiments revolved around the transformation of regular in-person graduate seminars into ‘international collaborative seminars’ that involved two international groups of students at two simultaneous teaching sites linked through synchronous web-conferencing and asynchronous online work. With the CoI survey we tested the hypothesized causal relationships among the three presences. The results confirmed the relationship that teaching and social presence have a significant perceived influence on cognitive presence, but interestingly, teaching presence is perceived to influence social presence less than cognitive presence. These results underline the overarching importance of teaching presence in facilitating cognition in a formal online learning community however they also direct our attention to further exploring its role in the social dimensions of the instructional processes.

Introduction

The Community of Inquiry (CoI) serves as a framework for conducting research into formal (higher-level) online and blended learning in higher education (Garrison & Arbaugh, 2007). It maps and defines educational presence (Garrison & Cleveland-Innes, 2005), and as such, integrates social, teaching and cognitive dimensions of the teaching and learning process. Since their inception, both the framework and the CoI survey have been validated in multiple studies (Arbaugh, 2007), and yet, the causal relationships among the presences require empirical demonstration (Garrison, Cleveland-Innes & Fung, 2010). In particular, the overarching effect of teaching presence on the contextual dynamics of the presences needs further investigation. Similarly, the question whether social presence makes significant contributions to the prediction of cognitive presence has been addressed but is still in need of exploration (Swan et al., 2008).

Telecollaborations (O'Dowd, 2013) served as a methodological precedent to our redesign model of 'international collaborative seminar', which refers to a university course involving two in-person learning communities located at two simultaneous teaching sites collaborating through web-conferencing and asynchronous online work. In such courses students experience the complex dynamics of international, interdisciplinary, online and face-to-face, synchronous and asynchronous learning. Hence, this unique instructional set-up with the synergy of experiences necessitates our focus on the nature of causal relationships among the presences that are at play.

Hence, in this paper we aim to measure the interpretability of the factor structure of the CoI survey used to measure students' perceptions of teaching, cognitive and social presence and attempt to advance research on the CoI through the investigation of the contextual relational dynamics of the three presences in the redesign model 'international collaborative seminar'.

Conceptual framework

The CoI framework is grounded in the social constructivist paradigm that knowledge construction occurs through critical inquiry in a collaborative learning setting (Arbaugh, 2007; Garrison & Arbaugh, 2007) and this, as Garrison and Vaughan (2008) argue, resonates with the ideal expectations towards teaching and learning in higher education.

The model assumes that through the three presences – cognitive, teaching and social presence – the various dynamics of the online and blended teaching and learning processes can be depicted. Cognitive presence is grounded in Dewey's (1938/1991) theory of inquiry and critical thinking, and is described as "the extent to which the participants in any particular configuration of a community of inquiry are able to construct meaning through sustained communication" (Garrison et al., 2000, p.89). Cognitive presence is thus operationalized as a practical inquiry involving a systemic progression of cognition from triggering event, exploration, and integration to resolution.

Teaching presence refers to the design of the materials and processes, facilitation of critical discourse, and direction of discipline-specific instruction. Therefore, teaching presence, according to Anderson et al. (2001), begins before the course commences since the teacher plans and prepares the course, and it is maintained throughout the course as the teacher facilitates the interactions and collaborations. It thus describes an overarching responsibility to orchestrate the many dimensions of the inquiry process so that students accumulate personally and academically relevant learning (Garrison & Arbaugh, 2007).

The third – most re-conceptualized – element of the CoI framework is social presence, that is defined as "the ability of participants to identify with the community (e.g. course of study), communicate purposefully in a trusting environment, and develop inter-personal relationships by way of projecting their individual personalities" (Garrison, 2009).

Exploring Causal Relationships among Teaching, Cognitive and Social Presence in International Collaborative Seminars: Initial Findings Using the Community of Inquiry Survey

Helga Dörner

According to the framework, social presence has a mediating function between teaching and cognitive presence. As Garrison et al. (2010) argue, it is “a responsibility of teaching presence and a condition for creating cognitive presence” (p.32). Previous empirical research has shown that there is a causal relationship between teaching presence and perceived learning as well as student satisfaction (Akyol & Garrison, 2008; Arbaugh, 2008) and that there is a causal relationship between social and cognitive presence (Shea & Bidjerano, 2009). With acknowledging the evidence provided by previous research on the CoI framework and the survey, we aim to further explore the contextual dynamics of the three presences in the redesign model ‘international collaborative seminar’ that integrates synchronous, asynchronous, online and face-to-face, international and interdisciplinary learning processes.

The following are the research questions:

1. What is the predictive relationship of social and teaching presence with the development of cognitive presence in this redesign?
2. What is the ability of teaching and cognitive presence to predict social presence in this redesign?

Methods

We draw our data from a series of international collaborative seminars that were designed, conducted and studied collaboratively by an international team of faculty and instructional designers in Fall 2012, Fall 2013, Spring 2014 – involving 82 graduate students of social sciences and humanities. In each semester, two institutions conducted a 12-week-long seminar, which integrated interdisciplinary approaches from gender studies, history, museum studies, Holocaust and genocide studies, literature and cultural studies, and film studies. The Hungarian university, the organizer, was the ‘permanent’ institution in each case. The partner universities were from the US and Estonia.

The CoI survey was used to predict relationship among the presences. The CoI survey is a 5-point Likert scale instrument that consists of 34 items describing the three presences. We employed standard linear regression in our analyses. We calculated the Cronbach’s Alpha values to measure scale reliability, that is, the internal consistency of a set of items within a variable group. The Cronbach’s Alpha measures demonstrate high scale reliability and internal consistency. These values together with the means and standard deviations are depicted in Table 1.

Table 1: Scale reliability and descriptive statistics ($N = 82$)

Presences	Cronbach’s Alpha	Mean	Std. Deviation
Teaching	.941	3.283	.907
Social	.913	2.887	1.086
Cognitive	.936	3.094	.966

Preliminary findings

Descriptive statistics

The means show acceptable levels of satisfaction, with large standard deviations indicating a significant clustering of replies around the mean. The lowest means are clustered on the indicators of social presence.

The predictive relationship of social and teaching presence with cognitive presence in this redesign

Analysis of variance showed that the regression model was significant, $F(2, 50) = 86.968$, $p = .000$. The unstandardized betas, standard error, and standardized betas of the predictors are presented in Table 2. Initial analysis indicates that teaching and social presence make significant contributions to the prediction of cognitive presence – approximately to an equal extent. Also, preliminary results showed that teaching and social presence explained approximately 77% of the variance in cognitive presence, which is indicative of a robust relationship. Details of hierarchical regression indicating the statistically significant predictors among the items of the CoI will be available later (at the paper presentation).

Table 2: Summary of regression analysis of social and teaching presence on predicting cognitive presence ($N = 82$)

Variable	B	SEB	β	Sig.
Teaching presence	.474	.113	.445	.000
Social presence	.436	.094	.490	.000

The ability of teaching presence and cognitive presence to predict social presence in this redesign

Results indicated that this model was also significant $F(2, 50) = 64.584$, $p = .000$. The correlation coefficient of .85 indicates that the predictors can account for 71% of total variance of social presence. As seen in Table 3, teaching presence makes considerably less contribution to the prediction of social presence than cognitive presence. This indicates that teaching presence, in this redesign model, has less robust predicative relationship to social presence as compared to cognitive presence. Again, details of hierarchical regression that describe the statistically significant predictors among the items of the CoI will be presented later.

Table 3: Summary of regression analysis of teaching and cognitive presence on predicting social presence ($N = 82$)

Variable	B	SEB	β	Sig.
Teaching presence	.323	.158	.270	.047
Cognitive presence	.689	.149	.613	.000

Discussion

As found, the three elements of the CoI are highly interconnected and influence each other in this redesign model. The international collaborative seminars thus managed to provide an integrative approach to the synergy of experiences triggered by the teaching and learning processes. The results also confirmed the hypothesized relationship that teaching and social presence have a significant perceived contribution to cognitive presence. But interestingly, teaching presence is perceived to influence social presence less than cognitive presence. These preliminary results underline the overarching importance of teaching presence in facilitating cognition in the formal online learning community, such as the one created in the international collaborative seminar, however, they also direct our attention to further exploring its role in the social dimensions of the instructional processes. That is, consciously adopted strategies of interactivity such as expressing agreement and appreciation, acknowledging the other's point of view, referencing previous ideas etc., may impact cognitive engagement thus constructivist approaches to discussion leadership need to be thoughtfully integrated in the instructional design. Finally, it still remains important to investigate the instructors' contribution, through their design and facilitative strategies to social presence since these formal online learning communities are often impeded by the design and instructional practices characterized by the one-directional flow of knowledge extant in the higher education context (Annand, 2011).

Details of hierarchical regression, conducted to identify the statistically significant predictors among the items of the CoI will be also presented with the aim to further refine our understanding of the contextual dynamics among the presences and to also arrive at the pragmatic and functional implications for the purposeful instructional design of similar models in the higher education context. We also intend to discuss the limitations of the applied research tools.

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TOWARDS A COLLABORATIVE SPACE FOR LEARNING DIGITAL SYSTEMS

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Abstract

Practical skills such as Programming Languages or Digital Systems Design are learned by experience. Such skills are not mechanical processes, but rather a creative one. For this reason, students should practice repeatedly and receive constant feedback in order to further progress in their learning process. Nevertheless, it is difficult for instructors to give constant and individual feedback in this type of exercise, as there are many different correct strategies to construct a valid solution. Intelligent tutoring systems can be used in order to automate individual feedback, however the lack of intervention of the instructor or other students in the process of solving the design hinders the learning process. This study aims to examine the effect of the combination of a automated tutoring system for learning circuits design with an asynchronous collaborative space organized in different groups. Findings indicate that the student retention, the students' performance and collaborative knowledge construction is enhanced with this combination.

Introduction

Most of the degrees in Computer Science or Engineering have subjects related to the specialty of Digital Systems. Several skills are acquired in the area, such as the design of digital systems. The student learns to understand the digital world, and consequently the digital circuits, and how a set of output values are produced from a set of inputs values using logic gates, combinational blocks, such as, multiplexers or adders, and sequential blocks, such as, registers or memory elements. These subjects are commonly taught in the initial semester of the degrees since the learning concepts are required for more complex subjects in the area of the computer organization, networking and electronic systems.

Teachers involved in these subjects have two main challenges. First, to design an introductory course where the learning objectives previously described have to be acquired; and second, to design a course for newbie students in higher education. Additionally, degrees imparted in virtual environments have an extra handicap related to how instruct students in skills that need practice. The first challenge is a well-known problem. Several works [6] have already showed evidences about misconceptions the students have related to the learning of digital systems. Therefore, different approaches have been designed to instruct the courses [1, 7]. Some of these works rely on face-to-face learning and laboratories without taking into account

distance learning. The second challenge is a common issue in subjects on the first semesters of any higher degree [11]. Students are not used to learn in a higher education environment producing low performance and high dropout rates. An additional challenge is when the degree is delivered on a distance learning environment where other learning resources have to be added in order to teach concepts that need practice: simulation software, intelligent tutoring systems, virtual labs.

All these learning resources on distance learning tend to provide an individual environment to learn without taking into account the collaboration perspective due to the difficulties on the communication. Our research questions are related to evaluate the possibility to promote collaborative learning on these individual tutoring systems. This paper presents a new design and classroom organization of the course Computer Fundamentals in our university in a virtual learning environment. A new classroom organization based on small groups and a plenary laboratory group combined with an intelligent tutoring system helped to increase the student performance, student interaction and collaborative knowledge construction.

Course Overview and Learning Methodology

In the course of Computer Fundamentals, a student has to acquire the skills of analysis and synthesis of small digital circuits and to understand the basic computer architecture in 150 hours. The synthesis process is presented at the logical level without describing all the inherent electronic problems. Moreover, a student should be able to implement the FSM of simple sequential circuits with data path. The assessment is divided in 3 continuous assessment activities (CAA), one final project and one final exam.

The course combines three types of learning resources: i) The material of the course is organized as a textbook. The book contains all the theoretical aspects with several practical examples to illustrate their application. ii) There is an online discussion forum moderated by an instructor, where the students can interact. There are insights that there is a positive relationship between collaborative student engagement and course performance [4] in distance learning. The forum promotes a collaborative channel where a student can benefit from doubts, errors and comments of the other students. The students help each other and gain better understanding of the proposed exercises. They can discuss their assignments; share and compare methodologies to solve exercises; synthesize proposed solutions via reasoning/arguing; and reach agreements/explore disagreements. The value of the collaborative learning is essential to stem social interaction which increases retention and mutual knowledge construction. The collaborative learning is enhanced by the moderation of an instructor by validating the comments of the students and giving guidelines to increase the quality of the learning process and the construction of knowledge within the online forum. In our learning methodology, the online forum is one of the primary tools since they involve active participation from students by writing posts, asking specific questions about a specific exercise or concept, and sharing resolutions in order to be criticized by other students (and not only by the instructor). iii) An intelligent tutoring system, called VerilUOC [2] is used to practice the design of digital circuits. The objective of the system is two-fold: In one hand, the

student has an edition and simulation tool to design and test the digital circuit. In the other hand, there is a complementary module where exercises from the textbook, the continuous assessment activities and the exams of previous semesters can be solved. The module allows to automatically validate the correctness of the design performed by the student compared to the canonical solution provided by the instructors. In case of mismatch, the tutoring system gives a counterexample as a personalized feedback to guide the student to the correct solution. This tool was conceived assuming an experiential learning method combined with a problem-based learning. Learning from experience is important to clarify the concepts and practice. The set of exercises proposed in the systems should be enough to acquire the sufficient level of knowledge in order to be able to design simple difficulty circuit and to pass the course.

All the three learning resources are combined in order to provide a successfully learning experience. The potential benefit of collaboration during problem-solving is that a deeper elaboration can be reached. Although students may produce non-canonical solutions or even incomplete solutions [8], detecting differences between solutions or comparing erroneous and correct examples [3] can guide the students to a higher level of knowledge construction. Although the intelligent tutoring system can be used without any interaction among students, we have detected the interaction using the online discussion forum enhances the knowledge construction. Note that, the forum gains relevance on a virtual learning environment (VLE) where there is no face-to-face interaction.

The number of students of Computer Fundamentals is approximately 300 students for each semester. Until 2013 Fall Semester, the course was organized in different virtual classrooms with a reduced number of students (60-70) per classroom. The aim of this division is to provide a higher quality education since the teacher who performs the instruction has a reduced number of students in the classroom. Therefore, the moderation of the forum, the evaluation of the activities and the personalized feedback can be managed properly. In this last semester, we observed a significant decrement of the activity on the forums. Students started tending to study individually and few students used the forum to post messages. The instructors also complained that there was an increment of individual messages via the instructors' email address that students posted in the forum on the previous semesters. This is a serious concern since the knowledge acquisition is no more shared among students. Additionally, we observed also a decrement of the number of exercises performed using the tutoring system. The students have difficulties on solving exercises and they asked directly of the instructor instead of asking on the forum. There is some well-known issues in our VLE that produces this undesirable behaviour. Students typically choose our online university because they have a professional activity or familiar commitments. This means that some students tend to study part-time and they are very conscious about the use of their time. Therefore, students who feel unprepared for an activity or a course are more likely to abandon it rather than submitting low quality solutions. Moreover, some students in these initial courses realize the degree they started is not the professional outcome is looking for. These issues cause high dropout rates reaching in some cases more than half of the enrolled student and affecting severely the collaborative interaction in the forum.

On 2014 Spring semester, we decided to try to amend this tendency to the total individual study by reorganizing the structure of the course. We propose to connect the students who seek collaborative learning by adding a new space. This space that we called laboratory class is basically a plenary new discussion forum where all the student of the course (of every classroom) can post messages and it is moderated by another instructor. A similar approach has previously presented in 10 where the organization of the course was divided in small groups in the first eight weeks of the course and an opportunistic plenary group in the last weeks. The research pointed out this organization produces positive results on the learning process. Authors in 9 also proposed a study related to the organization of a course with small groups with a plenary class. The collaboration was enhanced with scripts to foster the online search competence. Our organization combines characteristics of both approaches: small groups plus a plenary group during all the semester but without scripts. We are interested in forums where students can freely communicate without any restriction. The previous forums were not removed, we only change their orientation. The theoretical aspects and questions related to the organization of the course are discussed on the small group forums, whereas the new forum is only intended for the practical activities and the exercises proposed using the intelligent tutoring system. We claim that the new organization can foster again the collaborative learning at least in the practical aspects of the course and improve the collaborative knowledge construction. The concerns that we address are the research questions of the study: i) How does this new space improve the collaborative learning? ii) How is the students' performance affected? iii) How is the knowledge construction affected by the new space?

Findings

Participants and context of the study

In order to answer the previous questions, different data has been collected from two semesters. One semester corresponds to the 2013 Fall semester with the old organization, and the other one corresponds to the 2014 Spring semester with the new organization. Table 1 summarizes the total number of students and its distribution among the virtual classrooms. As we can observe, we have a large sample of students in both semesters. Note that, on the 2014 Spring semester, the course had less number of students (there are commonly more enrolments in the course on the fall semesters). Therefore, the fifth classroom was not opened for instruction.

Table 12: Number of students in each classroom

	Class 1	Class 2	Class 3	Class 4	Class 5	Total
2013 Fall Semester	77	72	67	67	66	349
2014 Spring Semester	69	61	60	60	-	250

The new organization fosters the collaboration

In order to analyze whether the new space increases the collaboration among students, the total and average number of messages the students have posted have been analyzed. Taking into account that there were 100 students less in the course in the last semester, the total number of posts increased by 20%. Although the number of posts per students on each classroom decreases in the last semester, the average number of messages per student also increases from 3.46 to 5.80 with a similar variability on the number of messages (reflected by the standard deviation). We assume that the decrement of messages is due to the introduction of the new space since all the message related to the practical aspects were moved to the laboratory class. Although Table 2 gives some evidences of the increment of the participation, the results do not reflect the number of active participants. The second analysis tries to reflect this fact.

Figure 1 shows the distribution of students based on the number of published posts. The figure shows a high number of inactive students in all the forum in both semesters due to the issues explained aforementioned. There are cases where this number reaches the half of the classroom. Moreover, many students only posted one message corresponding to the presentation message leaving the active participants (we assume students with more than one message) on 30% on average. However, the introduction of the laboratory space increases significantly the number of active participants reaching the 40% of the total enrolment on the course. Some students that only posted one message in the forum of their classroom were active in the laboratory.

This result proves that the new space helps the students involved in the course to find a communication channel with students with similar concerns. Students that want to work individually or drop out the course remains in the small group classroom, leaving the laboratory to students interested in increasing their knowledge. Moreover, all the messages posted in the laboratory class are focused on the practical issues. Messages without learning outcomes, such as presentations or opinions, do not tend to be posted. For example, we can observe that students that posted one message are less than the 9% of the students (19 messages). With respect to the moderation task of the instructor of the laboratory, we conclude that the class can be assumed by one instructor since the number of active participants finally was 40% (around 100 students).

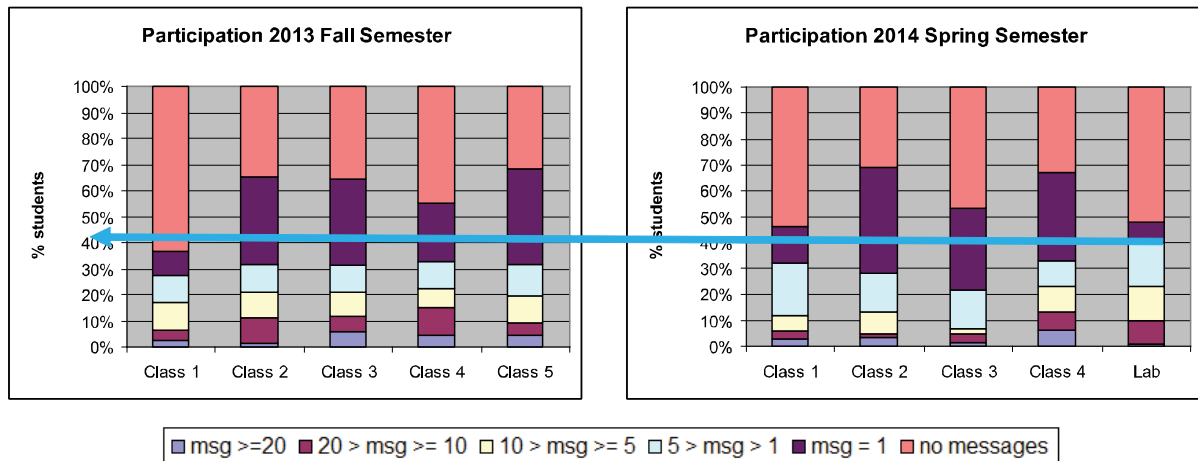


Figure 1. Distribution of students versus the number of published messages

The students' performance and retention improve with the new organization

It is important to check how the laboratory space affects the students' performance. Table 2 summarizes the submissions and the pass rates on the continuous assessment activities, the final project and the final exam.

Table 2: Students' performance on the assessment activities

	2013 Fall Semester		2014 Spring Semester	
Classroom	% Submission	% Pass	% Submission	% Pass
CAA 1	84.57	76.00	86.80	80.00
CAA 2	66.57	52.00	65.20	50.80
CAA 3	53.71	40.57	54.00	42.00
Final Project	46.00	34.29	49.20	42.80
Exam	47.43	32.29	50.40	40.40

The results are not the expected ones in the continuous assessment activities. We expected a significant increment of the submissions, but the percentage remains similar to the previous semester. Therefore, the dropout rate remains similar between semesters. However, the students' performance is slightly better in the last semester during the continuous assessment activities and superior in 8% in the final project. The exam pass rate also increases by 8% giving the perception that the knowledge acquisition at the end of the course has improved.

The collaborative knowledge construction increases

We propose to compute the knowledge construction by two evidences: the success rate between submissions and solved exercises in the tutoring system and the correlation between the activity of the new space and the submission in the tutoring system. The first evidence shows the individual and collaborative knowledge production in the system. The second one gives some hints between the relation of the submitted exercises and the collaborative work in the forum. Table 3 shows an important increment of the utilization of the tool between semesters. In terms of the number of submissions, the increment was nearly an 80%, meanwhile the number of solved exercises was nearly a 91%. This is also reflected on the average number of exercises submitted and correctly solved. Both numbers increased by nearly 8 exercises per student. However, the distribution was notably different in the last

semester indicating that many students solved a large number of exercises. Note that, this statistical result takes into account users that never accessed the tutoring system. If these students were not taken into account, the number of correct exercises increased to nearly 22 exercises in the last semester, outstandingly better than the 10 exercises of the previous semester.

Table 3: Knowledge construction in the VerilUOC system

	2013 Fall Semester		2014 Spring Semester	
	Submitted exercises	Correct designs	Submitted exercises	Correct designs
Total	1896	1651	3424	3151
Successful rate		87.10%		92.02%
Avg. by student (stdev.)	5.41 (6.95)	4.71 (6.47)	13.70 (20.79)	12.60 (20.04)
Avg. by active student (stdev.)	8.60 (6.85)	9.88 (6.73)	20.07 (23.40)	21.80 (22.93)
-- active students in the tool	-- 192		-- 157	

Finally, we wanted to reflect the impact of the new space in the submission of exercises in the tutoring system. Figure 2 illustrates this correlation that was 0.66 in total. The dates with major activity in the forum highly correlate with the major activity in submissions in the tutoring system. Note that, dates with major activity corresponds on submissions of the second (CAA2), third (CAA3) continuous assessment activities and final project (FP). The first CAA is not reflected in number of submissions since the tutoring system is not used for this activity. Discrepancies between both data appears on the beginning of the semester where messages with presentations and questions about configuring and deploying the tool were posted and at the end of the semester where the students prepared the final exam. The total number of submissions was 11,394, a significant increment (44%) compared to the 7,896 submissions of the 2013 Fall semester.

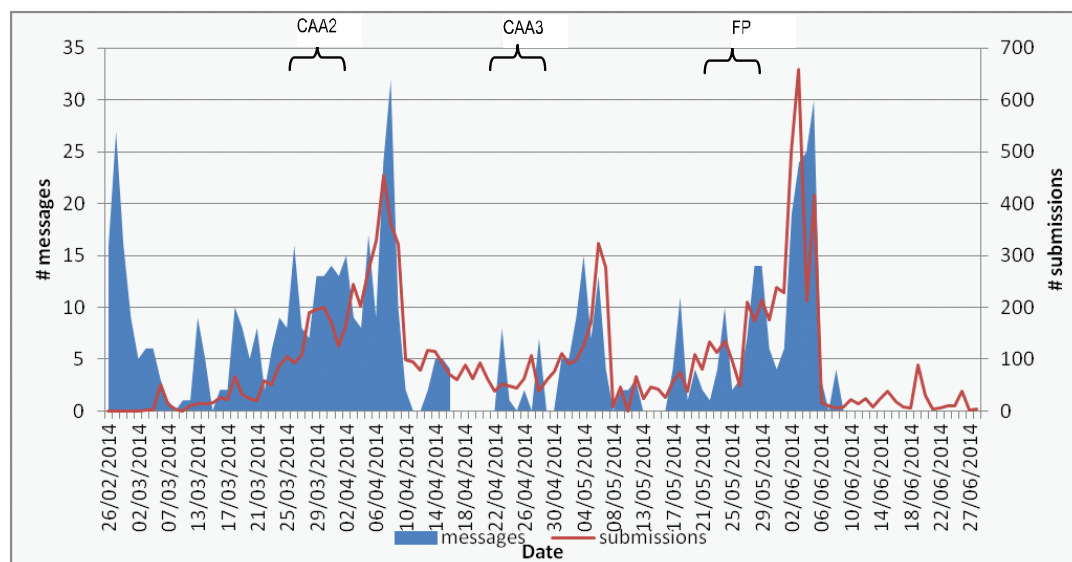


Figure 2. Comparison forum activity vs. submissions in tutoring system

Conclusions and discussion

Asynchronous communication tools like forums are highly recommended for any collaborative learning methodology. Others tools can be also used like wikis, blogs, but this selection highly depends on the type of collaboration. However, sometimes depending on the type of skills or competences have to be learned (in our case digital systems design) other learning tools like intelligent tutoring systems have to be used. Thus, the intelligent tutoring system VerilUOC was implemented. Although, this system can be used individually to learn the design of circuits, the analysis performed in this paper shows evidences that the skill of circuit design was not properly learned with this standalone tool and, therefore, the cohabitation with this new organization of the communication channels impacts in the learning engagement of the students. Many advantages have been showed: increment of the engagement of the student in the classroom activity, (slightly) increment on the students' performance and increment on the collaborative knowledge construction in the course.

We are aware that there are some threads to validity in this study. First, the global pass and submission rates on assessment activities should not be comparable between semesters, as they are affected by other external variables, such as deviations in the level of difficulty of the exams and activities or changes in the instructor assigned to each class. Hence, the comparison of the student performance should be performed within each semester and not among semesters. However, we were not able to create multiple groups of study in the same course, since there are some policies in our university that demand an equitable opportunity to learn for all the students. Therefore, the study was performed between semesters.

With respect to the utilization of the forums, the analysis shows a low number of posts per student and this seems to prove a lack of utilization of the forum. As aforesaid, many students have professional and familiar commitments that directly affect the time invested on the course. Therefore, students only use the forum when it is necessary. Moreover, the high dropout rates, i.e. Table 2 shows that the half of the students have not submitted the activity in the third CAA (the middle of the course), implies that the activity of the forum is sustained by a lower number of active learners compared to the enrolled students.

The additional threads to validity we have considered are the interaction of different treatments and selection bias. A potential threat to construct validity is the interaction of different treatments. The reader may think the improvement of the diverse evidences is due only to the utilization of the tutoring system. The tutoring system was introduced in the course on 2012 Spring semester. During all these semesters, the utilization of the system was similarly low to the 2013 Fall semester (1,120 submissions on 2012 Spring semester, 8,262 on 2012 Fall semester, and 7,882 on 2013 Spring semester). However, a significant increment has been showed in the previous section on the semester of study (11,394 submissions). Therefore, we assume that the impact was related to the new organization of the course. Moreover, there was an increment of the number of messages and even the major activity in the collaborative discussion forums matches the dates where the continuous assessment activities are submitted (See Figure 2).

Another potential threat to internal validity is the selection bias. Students that tend to get better scores are more active in the forum and the utilization of the tutoring system. These students may bias the global results, i.e. the number of messages or submissions in the tutoring system may be produced by a small population of the learners. However, we can observe with the different data we provided that the increment is generally in all the students of the course. Figure 1 depicts that the active participants increased in the last semester in the laboratory class and this fact is not only affected by proactive students. Moreover, Table 3 also proves an increment of the exercises submitted by different students.

As future work, we are interested to analyze if this tendency is confirmed on next semesters. Finally, the new organization will be applied on other courses with similar characteristics (large number of enrolled students, practical skills, learning support tools) to observe if similar results are obtained.

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CONSTRUCTING THE DIGITAL UNIVERSITY – OPEN, COLLABORATIVE MODELS FOR STRATEGIC PEDAGOGIC AND TECHNICAL CHANGE

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Introduction

The notion of the Digital University has gained traction in the last few years as a key topic in the discourse of organisational and educational development in Higher Education around the world, and as a focus for academic research in areas including learning literacies, teaching practice, and technological developments (e.g. McCluskey & Winter, 2012; Goodfellow & Lea, 2013; Selwyn, 2014).

We felt that exploration of this overarching term offered the potential to act as a catalyst for fundamental change throughout an institution from administration to teaching and learning.

Our starting point in 2011 was trying to provide answer to ‘what do we mean by the Digital University?’ We challenged the assumption that this was a largely trouble free concept driven by technological innovation and infrastructure developments, which could be managed through existing institutional structures. Emerging narratives included an overly techno-centric view that technology alone constituted an environment that could be nominated as “digital”. We felt a need to acknowledge the human and social processes involved and proposed that a truly digital university can only be fully realised where there is a fusion between technology and staff/student developments driving innovation and creativity.

Our approach involved: discussion; generation of models that we shared openly via a blog; presentations, workshops, publications; and a major collaborative effort with a Scottish university. This open process characterised by its collaborative, generative, pro-active nature is illustrated in Figure 1 below.

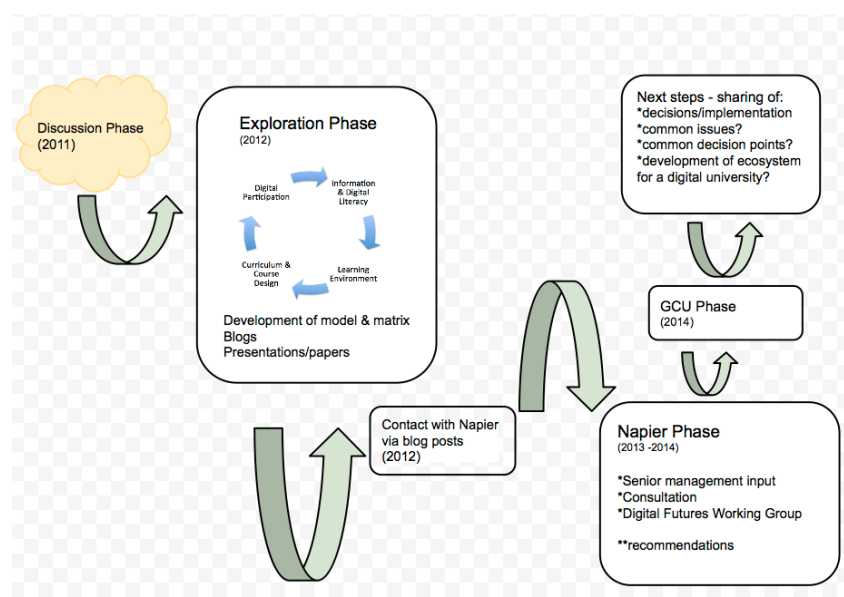


Figure 1. Open dialogue and engagement process

A Conceptual Matrix for the Digital University

During 2012, two of the co-authors of this article set out to develop a strategic model which would provide a multidimensional, holistic view of the concept of the Digital University, and one which could offer a flexible tool for engaging staff in identifying and formulating systematic programmes for change through harnessing, or developing, digital spaces, practices, and provision. This work was instantiated within a series of blog posts entitled “A Conversation around what it means to be a Digital University” (MacNeill & Johnston, 2012).

The Conceptual Matrix for the Digital University that emerged as the key outcome of the above work (Figure 2) is based on four key constructs – digital participation, information literacy, learning environment, curriculum and course design – and the interrelationships between them.

Digital Participation	Information Literacy
<ul style="list-style-type: none"> *Glocalization *Widening access *Civic and responsibilities *Community engagement *Networks (human and digital) *Technological affordances 	<ul style="list-style-type: none"> *High level concepts and perceptions influencing practice *Staff & student engagement and development *Effective development and use of infrastructure
Curriculum and Course Design	Learning Environment
<ul style="list-style-type: none"> *Constructive alignment *Curriculum representations, course management, pedagogical innovation *Recruitment and marketing *Reporting, data, analytics 	<ul style="list-style-type: none"> *Physical and digital *Pedagogical and social *Research and enquiry *Staff and Resources

Figure 2. Conceptual Matrix for the Digital University (MacNeill & Johnston, 2012)

Digital Participation involves public engagement by the university with government digital policy and the growing potential of social/consumerist interactions offered by digital technology and the Internet. Information Literacy enables Participation through developing skills, identifying full range of academic relevance and personal development. Both are channelled through the university's Learning Environment, which is conceived in both technological and academic/pedagogical terms. All three influence and condition Curriculum and Course Design.

The conceptual matrix was designed as a strategic tool for institutions to:

- Analyse policy documents.
- Channel strategic discussion.
- Focus on specifics whilst retaining a broader perspective.
- Shape the division of labour to best effect.
- Co-ordinate projects, debate, decision making and action.

The Conceptual Matrix can be used to ask key questions relating to each of the four quadrants. For example, how is Digital Participation managed in the university – is this within widening access initiatives or lifelong learning provision? Where is Information Literacy visible in the university – is this in library programmes, or perhaps staff and student development provision? How is the Learning Environment currently conceived in the university – as a unified concept or divided between infrastructure and estate, or teaching and learning? And who has the locus in Curriculum and Course Design, development and management – where do decisions reside, and how influential are overall institutional objectives on outcomes common to all courses (e.g. employability, citizenship) in shaping practice at ground level?

Applying the Conceptual Matrix

Since being developed the Conceptual Matrix, and associated tools, have successfully been applied in aiding strategic discussions and scoping possible future developments at a number of universities in the UK (including the University of Dundee, University of Greenwich and Glasgow Caledonian University), and also at Macquarie University in Sydney. However perhaps the most significant application of the Conceptual Matrix thus far has been in the Digital Futures consultation undertaken at Edinburgh Napier University between 2013 and 2014.

The matrix proved invaluable by providing a means to both reflect on the institution's position and begin identifying possible directions for Edinburgh Napier as a 'Digital University'. The application of the matrix in the initial dialogue at Edinburgh Napier also helped establish an understanding that being a 'Digital University' was not about being digital in all that the institution set out to do, but was instead about being a university that could harness current and emerging digital technologies and practices to enrich curriculum and other key aspects relating to learning and teaching.

Using the Conceptual Matrix, Edinburgh Napier were able to develop a strategic institutional response that was holistic, consultative, iterative and innovative. A number of diverse perspectives were uncovered often informed by the responsibilities that different individuals or departments have for specific aspects of digital practice within the institution, representing a form of ‘value pluralism’ (Johnson & Smyth, 2011) that presents a key challenge in taking a broader view of what it means for a university to ‘be digital’.

Full details of the Edinburgh Napier consultation, and the resulting recommendations, are openly available at

<http://staff.napier.ac.uk/services/vice-principal-academic/academic/strategyactivity/DigitalFutures/Pages/Digital-Futures.aspx>.

Many of the short-term recommendations were focused on the consolidation and enhancement of current digital practice and provision. Longer-term recommendations are of a more aspirational nature and concern: innovation in open educational practice; learner engagement in online professional communities; and learners as contributors to digital bodies of knowledge. In particular, the notion of the ‘digitally distributed curriculum’ was proposed as an important ‘organising concept’ for the longer term recommendations (Figure 3).

The idea of a digitally distributed curriculum was defined in the final report of the Digital Futures group as “one that provides an innovative learning and teaching experience, extends learning and teaching across cohorts and communities, can meet diverse needs around work-based learning and CPD, and that is digitally sustainable as well as pedagogically progressive” (DFWG, 2014, p.17).

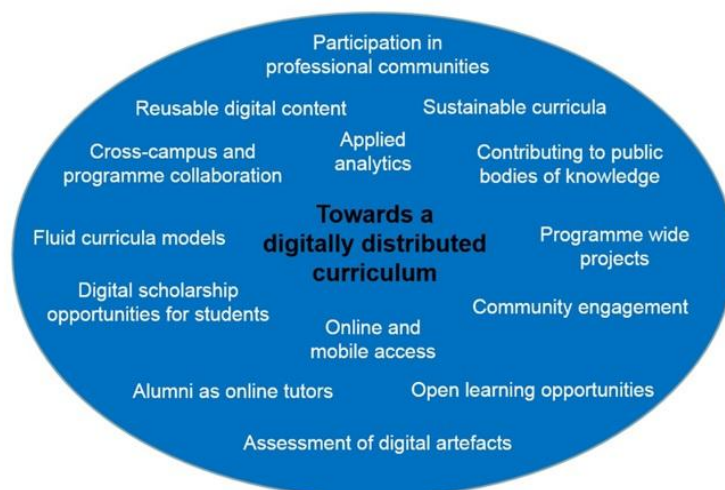


Figure 3. Towards a digitally distributed curriculum (DFWG, 2014)

The various recommendations of the Digital Futures Working Group are now being taken forward at Edinburgh Napier University through the DigitalU (or The Digital University) project that was formed in January 2015.

Future Developments

Our work in conceptualising and visioning the nature of the Digital University has taken us on a journey from the development of the Conceptual Matrix (MacNeill & Johnston, 2012) through the application of the matrix in the genesis and development of the Digital Futures consultation at Edinburgh Napier University, which has engaged us in furthering our collective thinking and ideas about the nature of the Digital University.

An important part of our future work will be to broaden out our dialogue and collaborations to involve other colleagues and institutions in coming to a more informed shared perspective on the realities, challenges and possibilities of the Digital University construct by, for example, exploring the relevance of the concept of an “ecosystem” (MacNeill, 2014).

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TELEPRESENCE WITH IPADS: LEARNING AND COLLABORATION IN LOWER SECONDARY SCHOOLS

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Abstract

Distributed learning is a growing issue in education following the mainstreaming of technologies such as videoconferencing. However, though distance and distributed learning have been common in adult education and business since the 1990s little is still known about the use of videoconferencing in elementary education. This paper reports from ongoing research in three rural schools in Denmark where the use of videoconferences are used as part of the teaching at lower secondary level. The research focuses on how students learn from videoconferences that are both one-to-many and peer-to-peer. Videoconferencing, conceptualized by the schools in question as telepresence, is performed in a unique combination of desktop interaction through mobile devices (iPads) and studio-based large screen lectures and interaction. Preliminary results of the research suggest that telepresence could be enhanced in schools by seeing it as a broad framework for collaboration between schools, in which different kinds of connections – both synchronous and asynchronous, mediated and face-to-face, large screen and desktop interaction – can support the placement of schools within the community and in the global context of learning.

Introduction

In the spring of 2013 I was asked to research an ongoing school development project in a rural part of the west of Denmark, where three schools had for a year been using videoconferencing for teaching basic subjects such as maths, German, science, history and literature. The purpose of the project, which was initiated by the local municipality, was to explore how the use of videoconferences in schools could support community and curriculum developments through increased collaboration between schools, access to experts and the establishment of links between schools, industry and community. Within these broad aims the municipality sought to respond to a variety of community challenges, for instance the depopulation of specific rural areas and the consequent limited access to resources such as specialized teachers and experts. Following a municipal reform in 2007, the municipality had increased in size and incorporated several rural school districts which necessitated a local strategy for linking schools and reorganizing available resources. As a result, the municipality initiated the project and at the same time schools invested in iPads for all students in lower secondary school (age 13-16).

The research project specifically explored the potential of videoconferences as a supplement to classroom teaching for qualifying lower secondary students' learning, with the three local schools as an empirical case. Research was done as an ethnographic, multi-sited study that included observations in all three schools as well as interviews with students. Research is ongoing and the following reports from the initial phase of the project from the autumn 2013 to 2014. The project ends in the summer of 2015.

Learning through telepresence: insights from the literature

Telepresence is a broad and complex term for a variety of phenomena involving embodied, virtual presence in mediated environments (Friesen, 2014; Levinsen et al., 2012). In this paper I shall focus on videoconferences as a telepresence activity, where telepresence is understood as a way of configuring learning rather than a specific experience of being present, as suggested by phenomenological approaches to telepresence (Dolezal, 2009; Draper et al., 1998). In understanding telepresence through videoconferences as a process of configuration, I am inspired by the idea that telepresence is contingent on local practices of for instance collaboration, subject cultures and modes of instruction (Pink, 2011). In this sense telepresence is placed in local practices and entangled within these practices (Dussel, 2013; Latour, 2005). Researching telepresence therefore involves studying new ways of placing technologies in schools, as well as new ways of placing schools in the community.

According to the literature, videoconferencing can be defined as “synchronous audio and video communication through computer or telephone networks between two or more geographically dispersed sites” (Cole, Ray & Zanetis, 2004 cited in Lawson & Comber, 2010). The potential of synchronous interaction is immediate interaction with others distributed in geographical space, which may extend learners' access to high-quality learning opportunities (Berge & Clark, 2005; Barbour & Reeves, 2009). As the practice of learning through videoconferences originated in higher education and business contexts (Lawson & Comber, 2010, Falloon, 2012) the role of videoconferences in learning are still relatively unexplored in elementary schooling, though successful experiences have been made in rural schools and with home-schooled children (Barbour & Reeves, 2009; Lawson & Comber, 2010). Introducing videoconferences in lower secondary schooling will therefore require a re-conceptualization of traditional pedagogies.

Though videoconferences, according to the literature, have the potential to increase social presence, community and educational opportunities in specific local areas and for specific students, several challenges are nonetheless connected with establishing these new social arenas. Challenges may include collaboration issues such as time-table coordination, booking requirements and technical limitations (Pitcher et al., 2000; Lawson et al., 2010). In addition to this, modes of instruction such as one-to-many lecture formats may disengage young learners who are used to more enquiry based learning. In the telepresence with iPads project schools sought to meet this challenge by constituting telepresence within the unique combination of studio-based lecture-like activities and student-to-student interaction through personalized technologies (iPads). Within this conceptual matrix, telepresence unfolded as

specific configurations of videoconference activities that were meant to suit learners in the 7-9th grade.

Moving between sites – methodological issues

Because of its focus on distributed learning, the telepresence with iPads research project has been inspired by multi-sited ethnography (Marcus, 1995; Hannerz, 2003). According to Marcus and others, multi-sited ethnography has provided a methodological framework for ethnographically following things, ideas and people in global contexts where phenomena are mobile and transient. Multi-sited ethnography thus moves away from the single-sited practice of conventional ethnography and follows the circulation of objects, practices and identities across sites.

In the telepresence with iPads project multi-sited ethnography has contributed to mapping relationships between schools and studying their collaboration through telepresence. As collaboration between schools is built into the project, multi-sited ethnography has followed telepresence as a phenomenon that emerges within these collaborations, i.e. the idea is that looking at it from one locality is only seeing it partially. In the project I as the researcher for instance had to map and travel distances between schools in order to understand how distance and other kinds of (dis)connections might act in relationships between local schools. In mapping and travelling distances between schools, I had to decide, in relation to each telepresence activity, where to be physically present and how to incorporate in my observations the experiences and learning of those that were remote.

Latour argues that “... elements which are close when disconnected may be infinitely remote if their connections are analyzed; conversely, elements which would appear as infinitely distant may be close when their connections are brought back into the picture.” (1996, p.4). My research therefore had to identify the complexities of these connections, in this case the multitude of ways in which connections and their distance-closeness effects could affect students’ learning.

One of the ways in which distance and proximity acted in the project was through the connections made between schools and with their affiliations with the local community. All three schools, though in average 15-20 kilometres distant from each other, were as mentioned above situated in the same municipality, and in many ways shared local histories and socio-economic conditions. However, organizational differences between the schools, such as differences in time tables, teaching styles and practices, often challenged the realization of collaborative telepresence events. In addition to this, teachers and students, though all in one perspective local, were mostly strangers to each other, and had not generally been given time to meet, get acquainted and plan ahead. For many teachers, collaboration is in itself a challenge as they are used to managing classrooms on their own, and opening up the classroom through videoconferencing can be daunting. In this sense local proximity – as argued by the literature – needs additional affiliations to create trust and give access to classrooms (see for instance Friesen, 2014). What seems to be close in terms of local

placement may therefore not be sufficient to support the relationships between schools that are necessary for collaboration and learning.

Case 1: Geography through telepresence

School A is a small, rural school in the west of Denmark where the students have been working with telepresence through their iPads as well as large screens situated in the classroom dedicated to telepresence¹. The students are working on a project in geography with school N, a larger, rural school situated about 16 kilometres away. The students in school A and school N have not met each other physically before the telepresence session, however, a few of the students know each other from communion class, leisure activities or other contexts.

School A and school N are collaborating on a geography project where Google Earth is used to tag places in different countries. According to the teacher in school A, the point of the project is to raise the students' awareness of local differences in countries like for instance Norway, USA, Belgium and Holland. Through Google Earth, he explains, students will ideally be able to identify infrastructural differences through the visual representations of local spaces in the Google Earth interface. As the project is collaborative between the schools, the tags are swapped in a kind of treasure hunt for national, geographical differences.

In the lesson I am observing, videoconferencing is used to instruct students in both schools in how to place the tags in Google Earth used for the treasure hunt. The teacher in school N is teaching the students in both schools, as the teachers have divided the tasks between them, and he is the only one who knows the functionalities of Google Earth. This means that the students in school A are obliged to address the remote teacher if they need help in understanding the assignment.

The focus of the telepresence session is, as described above, the identification and study of local/global space as a geographical phenomenon. Thus, images of the earth are projected and navigated easily by the remote teacher on the large screens covering the end of the wall that faces the students. In quick successions, students' gaze is invited to travel from a view of the Earth from out of space to a view of their local area in Denmark and then further into European locations. Students are meant to follow and replicate the remote teachers' instructions on their own PCs and iPads – which potentially adds a feeling of proximity to what is illustrated as well as draws on a student centred approach to the instruction.

However, as I shall argue below, the instruction generally fails to engage the students in school A, who for the most part very quickly become completely disengaged from the activity. This echoes the argument made by Richardson and Wilkin (2012), that the supposedly dematerializing effects of cyberspace and telepresence – in this case the projections on the screens – is always unfolded within specific, localized contexts and activities. What acts in the situation and inspires (dis)engagement is therefore, it seems, not geographical proximity or

¹ School A has a population of 214 students, School N 294 students, school T 257 students.

local affinity, but modes of attachment and instruction that keep the students from actively participating in the lesson. Thus, as the students are not familiar with the remote teacher, they fail to address him when they do not follow the instructions on the screen. As a rule, they prefer to ask their local teacher for help, but, because of the division of labour between the teachers, the teacher at school A cannot help them with the task. In addition to this, the mode of instruction and possibly the way in which school N is presented on the screen – displayed from a distance and with no eye contact with school A – disengages students from both the partner school and the subject at hand. What seems to be near in terms of geographical proximity and local identity therefore presents itself as infinitely remote in the specific context of the geography lesson observed.

Case 2: Learning German through telepresence

Case 2 consists of two separate scenarios where I observed how German was taught through telepresence in the same class in two different school years in school T, in collaboration with respectively school A and school N. In the first scenario German was taught peer-to-peer, i.e. through iPads, with FaceTime interaction between students in school T and school A. The students, who were at that time beginners in German as a foreign language, were asked to take turns with presenting themselves in German to the students in the collaborating school. This was done with the support of a piece of paper with notes that they had prepared before the lesson. In the second scenario students in school T and N were taught German adverbs one-to-many by a teacher at school N, who taught the basic grammatical principles of adverbs through a PowerPoint in a videoconference on the large screen.

Student to student interaction through telepresence

Communicating with authentic others through telepresence can support learners' communicative approach to the language and engage learners in the target language. According to Arnold, Cayley and Griffith (2002) and others, enhanced language learning is one of the significant impacts of videoconferencing. However, in language learning specifically, the anxiety of communicating with native speakers or strangers in the novel environment may intervene with the students' ability to profit from the synchronous event (Kinging, 1998).

In the first scenario FaceTime interaction was, as mentioned above, chosen as a framework for the task, as new learners of a foreign language often are reluctant to speak up in a plenary session where strangers are present. One of the principles underlying the use of interaction through the tablet screen was therefore to create a feeling of equity and proximity between the students. This was done both through the choice of subject – a presentation (in German) of the students' families and near relations – and through the pedagogical set-up which was student-to-student interaction through the small screen of the iPad. The iPad is arguably a more intimate platform for videoconferencing, as the iPad is a personal device and supports a close up view of communication partners.

Though the videoconference setting itself is a more intimate scenario than the geography lesson described above, issues of connectedness still affected the interaction of students in the learning process. As students in the two schools did not as a rule know each other and were not used to collaborating, interaction never became natural or fluent, and students generally clung to their pre-prepared manuscripts, transforming the situation into a shared reading event rather than a conversation. As interaction was generally based on transmission of information, a number of the students increasingly became unfocused and dissociated from the task in the course of the lesson. In addition to this the unfamiliarity of students with this way of learning the language affected their behaviour in the situation, which according to the teachers was to a large extent disruptive and lacked (n)etiquette.

Teacher to student instruction through telepresence

In the second scenario teaching German grammar one-to-many became a practice of language learning that contributed to shaping the experience of videoconferencing as a learning event. Contrary to the practice of speaking a foreign language, learning German grammar was configured as a big screen one-to-many learning event, where students in both schools were moved to an auditorium-like classroom and situated in rows. In this session the teacher from school N taught the principles of adverbial connections through a PowerPoint presentation on the screen. The teacher at school T was present as an assistant teacher to her own class. The lesson was, I was told by the teacher, a relatively classic enactment of a grammar session, where an aspect of the lesson was to try to experiment with the relationship between students in school T and their relationship to the teachers in respectively school T and N. The question was whether students would feel confident with addressing the remote teacher in German in the course of the lesson. As remote participants in the grammar lesson, students were at the outset placed as spectators to the presentation given by the remote teacher. However, after her presentation students in school T were invited to participate in the discussion of translations of Danish sentences into German. In this context the students were extremely reluctant to address the remote teacher and to speak out in the plenary in German. As a rule, students addressed their local teacher, and spoke out to her, though she was purposely seated at the row behind them. In the evaluation after the session, students generally said that they had enjoyed the lesson as a break from classroom based teaching, and that they felt the remote teacher had presented the grammatical issues clearly. However, they all felt uncomfortable with speaking out in the plenary, as students in school N were strangers to them and they were afraid of making mistakes in the plenary. In this sense they were primarily placed in the telepresence event as spectators, and chose to act within their local configuration of teacher-student relationships.

Discussion and some conclusions

The scenarios above illustrate some of the challenges, issues and potentials involved in connecting schools through telepresence understood as different kinds of mediated practices in everyday schooling. Whereas videoconferencing – according to the literature – has extensive potential for redistributing learning resources in rural communities and enriching

learning – actually making the connection(s) is, as the examples show, still affected by both logistics and issues of proximity and distance. In terms of logistics, the schools in question must – as shown above – aim to adapt their organizational and cultural specificities to the community of schools with regard to for instance timetables and teaching styles. When this adaptation is successful, three school organizations may to some extent become one and can act as one in the synchronous learning environment. What works against this, however, are not only organizational structures in the individual schools, but also the lack of familiarity and feeling of community between students and teachers who are in many senses effectively strangers inhabiting the same local municipality. Therefore, connections between students and teachers in the schools must in future be supported and enhanced in order to establish engaging learning forms in the mediated environment that can create this feeling of community.

Another issue that acts in the telepresence with iPads activities is the co-presence of several teachers and learners in restricted synchronous learning environments. As argued by the literature, synchronous interaction can be an extremely challenging framework for learning in terms of both logistics and effectively making the connections that support interactive learning practices (see for instance Anderson & Rourke 2005). This is an aspect of videoconferencing that schools should address and take seriously in their development of telepresence activities. In the schools in question, one of the challenges identified by the research is exactly these brief and fragile synchronous learning spaces that to a large extent fail to connect distributed students and teachers. Therefore, the synchronous activities in these schools might be enhanced by extending and supporting them through asynchronous and face-to-face activities that could establish a more solid and meaningful basis for collaboration by bringing real connectivity back into the picture. This will entail looking at collaboration – and telepresence – as a broad framework for learning between the schools, in which different kinds of connections – both synchronous and asynchronous, mediated and face-to-face, large screen and desktop interaction, can support the placement of schools within the community and in the global context of learning. One of the exciting aspects of telepresence is thus the ways in which the potential of mediation changes the directions of learning – i.e. brings them out of the brick and mortar environment and into communities that are both global and local and in which collaboration is directed at real world communities. One of the interesting issues to be taken up by the research described in this paper will therefore be a further study of the consequences of these new directions and connections of learning, i.e. how a deeper study of these connections between schools and communities can bring more learning potentials into the picture.

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CREATIVE COLLABORATION IN ONLINE COMPUTER-SUPPORTED COLLABORATIVE LEARNING

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Abstract

Creativity is a key competence for facing the society challenges of the post-industrial knowledge society (Garrison, 2011). Despite the importance of collaborative learning in the 21st society (Bates & Sangrà, 2011; Hesse, Care, Buder, Sassenberg & Griffin, 2015), creativity in educational settings has been mainly analysed individually. Moreover, the collaborative aspects of creativity have been not developed in the context of online collaborative learning (Romero, Hyvönen & Barberà, 2012), despite being a part of the 21st century skills. There is also a lack of assessment methodologies for the collaborative creative assessment (Wishart & Eagle, 2014). This study aims to contribute to the analysis of creative collaborative learning in online distance context through the conception and analysis of the Assessment Scale for Creative Collaboration (ASCC). The scale is evaluated in the context of an online learning course on Creativity in Advertisement in the virtual campus of the Universitat Oberta de Catalunya (UOC) in Spain.

Introduction

The changes produced in the world in recent years have made it necessary to consider creativity as a strategy for enabling future citizens to succeed in an increasingly complex world (Rogers, 1954; Wang, Schneider & Valacich, 2015). For this reason, creativity has been defined as one of the strategic learning objectives in education in recent years (Voogt & Roblin, 2012). Formal education from primary to post-secondary education has stressed the relevance of developing the creativity of their students. In primary education, a survey of European teachers carried out for the European Commission concluded that creativity must be seen as a fundamental competence to be developed at school (Ferrari, Cachia & Punie, 2009). Moreover, creativity has been identified as one of fifth most important skills for the 21st century education based on the analysis of the most used 21st century skills frameworks (namely: P21, ENGAGE, ATCS, ISTE, OECD, CASE) developed by Voogt and Roblin (2012). These authors identify the skills included in these different frameworks and then categorized the skills according to their shared presence. The creativity skill is present in the majority of the 21st century skills frameworks, and has even considered by some authors as a meta-skill (Kickmeier-Rust & Albert, 2012). For D'souza (2011, p.281) creativity is an ensemble of skills which emerges in a certain context, and "creativity, as different

combinations of skills may lead to different creative design products” In this study, creativity will be considered the generation of ideas that are original, valuable or useful (Sternberg & Lubart, 1995). For years, creativity has been conceived as an individual trait, but also as a process and the product of the process. In this paper we consider creativity from a socio-cognitive viewpoint as both an individual and shared process. We also define the concept of creativity individually and collectively, before considering the importance of collaboration in the creative process.

Creativity in Higher Education

Creativity as a social and cultural process and product is not merely an isolated original act or idea. Creativity is considered in this study before and beyond (and often without) the ‘Eureka moments’ concept, where a great breakthrough occurs (Shneiderman, 2000). Creativity is a context-related process initiated in a certain context and prior knowledge, where a solution is individually or collaboratively (co)constructed and considered as original, valuable or useful by a group of reference. Creativity output may result in an act transcending the creativity creator and producing changes in an existing domain or a new one (Sak & Oz, 2010). The importance of the usefulness of the ideas or acts that are considered as creative is highlighted by Franken and Bauers (2002). This author considers “creativity as the tendency to generate or recognize ideas, alternatives, or possibilities that may be useful in solving problems, communicating with others, and entertaining ourselves and others”. Creativity is no longer considered a mysterious breakthrough, but a process happening in a certain context as a process which can be fostered (Birkinshaw & Mol, 2006). Rogers (1954) focus on the inner conditions to foster creativity such flexibility, tolerance of ambiguity and certain “ability to toy with elements and concepts” (p.255). In academic settings, Silver (1997) propose to increase creativity in problem-posing and problem-solving among their undergraduates through fostering “the core dimensions of creativity: namely, fluency, flexibility and novelty” (p.75). In recent years, the increase of innovation and productivity needs, the teamwork and project oriented workplace has underlined the relevance of the collaborative creative process in the contexts of group work. Creativity has been considered as a collaborative and situated process (Eteläpelto & Lahti, 2008) that could not be understood as an individual process. Technology has been seen as an opportunity to support creativity both in individual and collaborative modalities (Lambropoulos, Romero & Kommers, 2011) despite there not being an agreement on the impact that technology has on the development of the creative collaboration process.

Creativity as a collaborative process

The analysis of the creative process in the context of individual creativity is carried out using McFadzean’s creative continuum (McFadzean, 1998), which considers the different stages of the creative process of collaboration that could be applied both in individual and collective settings. The time factor and the time quality is an important aspect of understanding learning activities (Romero & Barberà, 2011), and especially in the creative process of collaboration. This study also investigates the students’ perception of creative collaboration and the contextual variables of interest. A first element analysed is the degree of perceived co-presence

during the teammates' task. The teammates' engagement perception is one of the main factors of students' satisfaction in collaborative tasks. If the teammates' perceived engagement could support the creative collaboration process, the students' perception of an imbalance in their teammates' engagement could make them feel frustrated by the collaborative activity (Capdeferro & Romero, 2012). Tolerance of ambiguity has been analysed as another of the factors related to creativity (Zenasni, Besançon & Lubart, 2008); the novelty of the creative solution implies a certain playfulness and acceptance of ambiguity in the creative process and outcome definition. The degree of disagreement or tension between the team members is also considered as one of the factors that could be involved in the teammates' creative collaboration. A certain degree of disagreement and tension could support the creative collaboration (Thomson & Perry, 2006). The Assessment Scale for Creative Collaboration (ASCC) (Romero & Barberà, 2014; Wishart & Eagle, 2014) has been developed to consider these different factors involved in the creative collaboration process. The ASCC has been created within the context of the CoCreat Lifelong Learning Project. One of the research objectives of this study will also be to analyse the reliability of the ASCC instrument in the analysis of creative collaboration.

Methodology

The study involved 64 online learners of the Bachelor's degree in Audio-visual Communication. The students were engaged in the course "Introduction to Creativity in Advertising". The task proposed to the students during the course was carried out in dyads. The students were required to develop a creative advertising project during 4 weeks. In terms of temporal resources, the task is considered as a long-term task [25] with a high institutional temporal flexibility [26]. The students were invited to answer the Assessment Scale for Creative Collaboration (ASCC) (Romero & Barberà, 2014; Wishart & Eagle, 2014) at the end of the creative activity.

Assessment Scale for Creative Collaboration (ASCC)

The ASCC aims to analyse the students' perception of creative collaboration and the contextual variables of interest, such as the degree of co-presence during the task, the tolerance of ambiguity, the interest in the task, the degree of disagreement or tension between the team members and the time pressure. These items were included in the first section of the ASCC as the general items. The second section of the ASCC aims to assess 24 criteria that have been related to the creative collaboration process of the learners. For each of the criterion the students should answer one or more specific questions on a scale between 1 and 7 according to i) how much it was present during their project (presence subscale) and ii) how important it was to their group's success (importance to success subscale).

Results

The preliminary objective of this study is the analysis of the ASCC developed for analysing the factors involved in the creative collaboration process. The analysis of the reliability of the analytical instrument “Assessment Scale for Creative Collaboration” shows a high Cronbach’s alpha ($\alpha = .833$) in the presence subscale and in the importance to success subscale ($\alpha = .892$), which leads us to consider this a reliable instrument for the self-assessment of the collaborative creative process.

In the general items, the Temporal Pressure is the variable with the lower mean for this subscale ($M = 4.89$). The results are significantly lower in women ($M = 4.8$) than men. ($M = 5.11$). All the other variables in these subscales do not show significant differences.

For the “Presence” subscale of the items in the creative collaboration process, there are four variables with very low means, all of them related to the use of certain modalities and technologies for supporting creative collaboration. The use of Second Life ($M = 2.78$), the Video Conference ($M = 2.53$), but also face-to-face discussions ($M = 2.8$) and the use of social networks ($M = 3.6$) are considered by the students as modalities and technologies of interaction that are not related to the creative collaboration. In these variables, the means are lower in men than women.

In the “Importance for Success” subscale of creative collaboration performance, there are also 4 elements with lower means in terms of the relation defined between these criteria and the success on creative collaboration observed by the students. The relation between the use of Second Life ($M = 3.1$), the Video Conference ($M = 3.28$), but also face-to-face discussions ($M = 3.47$) and the use of social networks ($M = 3.86$) are considered by the students as modalities and technologies of interaction that are not important for success in the creative collaboration task. There are two variables with significant differences between men and women, the frequency of fun ($p = 0.02$) and the frequency of trust ($p = 0.03$) for creative collaboration. In both cases, women consider the fun and the trust as more important than men.

Discussion and prospective

The creative process in collaborative learning should be analysed by considering the students’ experience in their creative process and their collaborative learning, but also by observing the creative process in time. McFadzean’s (1998) creative continuum is particularly suitable for observing the creative collaborative process in the dyads, allowing the completion of the information provided by the ASCC. Further research should allow for better characterisation of creative collaboration and control of time pressure to enable the influence of this temporal factor in the quality of the creative collaboration to be observed. Moreover, future research in the field of creative collaboration could contribute towards consolidating the mixed-method analysis considered in this study and consider not only the specific population of the online campus but also students in face-to-face universities.

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ADDED VALUES AND CHALLENGES SOCIAL MEDIA REPRESENT IN THE HYBRIDISATION OF TEACHER TRAINING

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Introduction

Today digital technology plays a central role within important areas of society such as business, entertainment, transportation, art, education, and of course the media industry. The interesting question now becomes: How do students of our time acquire information? How do they find their way to knowledge? – Students use social media to communicate and to obtain information. Teacher students' activities in social media are high, both to nurture friendship and for professional development (Helleve, Almås & Bjørkelo, 2013). Higher education institutions are still primarily relying on traditional learning management systems (LMS). Research on what student says about being and learning in a formal online classroom (Nilsen, Almås & Krumsvik, 2013) indicates that students learning are social and that they create supporting arenas (Facebook and Twitter) in addition to the pedagogical platform the institution offers. But also newly qualified teachers establish, maintain and develop digital networks as an important source of development in the school subject and subject didactics (Engvik, 2014).

In a teacher education context, it is important to know this new interaction patterns that occur between children, adolescents and adults. Teachers must also consider how the information gathering and learning that occurs in the informal learning context can be used in a school context. Web 2.0-technology allows geographically separated learners to participate in a 21st century classroom. Unifying factors associated with the recent Web 2.0-technology are related to sharing, collaboration, networking and community. The characteristics of the content have changed to a more dynamic state, with a higher degree of participation and influence. Key pedagogical questions related to these changes in content and pattern of use is what learning competencies, knowledge and practices that develops.

This means that the educational foundation is challenged and a revitalization of pedagogy is in progress (Krumsvik & Almås, 2009). McLoughlin and Lee (2008) suggests a pedagogy 2.0 for network community containing three key P's; «Personalization, Participation and Productivity».

With this background this article discusses how teachers can orchestrate and facilitate learning with new technologies.

Our context

The authors are both working in higher education in Norway, and are conducting courses for students in teacher training programmes. Our experience is that the generation of students entering higher education expect flexible studies. This is also acknowledged by other studies (Dahlstrom & Bichsel, 2014). Technology is embedded into students' lives and they possess digital skills. They are used to social media, working often in groups via the web and use, share and retrieve information online.

Several documents express high expectations about the potential of technology in teaching, learning and assessing online in higher education (Allen & Seaman, 2011; Johnson, Adams Becker & Hall, 2015). But what kind of ICT skills teachers should develop during teacher education have not been discussed to any substantial degree (Kirschner, Wubbels & Brekelmans, 2008). Current approaches to initial teacher training and in-service training in digital tools and pedagogies are insufficient for the need (Johnson, Adams Becker, Cummins & Estrada, 2013, p.3). There is a need for new practices that respond better to the dynamics of the 21st century learning (Lieberman & Pointer Mace, 2010).

We know that:

1. they learn from others (than the teacher);
2. they learn from several (more than 1 or 2);
3. they learn from each other (peers);
4. they don't necessarily learn all at an educational institution.

These four points are by no means new. It has always been instructive to work in good study groups with clever fellow students whether you are in high school or in higher education. We also know that students' school performance is related to parents' education and access to homework help at home. However, the technology enables collaboration and access to competent others are easier. The policies in higher education in Norway allow students to use their own devices in the classroom, and cloud-based resources are increasingly being used by students as collaborative tools. And Norway is ranking third highest among European nations for posting to social media platforms (Johnson et al., 2013). This means that they

“arrive equipped not only with individual technologies that they maintain and improve, but also with their own personal learning environments and social networks. (...) Computer-based activities that are set in the classroom can be continued elsewhere and then shared at school. Students' personal collections and networks, gathered inside and outside school, can become resources for learning” (Sharples et al., 2014, p.4).

Norwegian authorities have taken several initiatives towards teacher education for us to be ready to meet future student teachers in a good way. Despite such initiatives, a recent survey on ICT in teacher education says that “Teacher training at all levels in Norway may not be fully meeting its responsibility of producing teachers who are sufficiently digitally literate to

help learners make the most of the tools at their disposal” (Tømte, Kårstein & Olsen, 2013, p.9). Other research justifies this by saying that “teachers may have difficulty understanding the complex relationships between technology, pedagogy and content, because these are often taught in isolation in most teacher education programs” (Koehler, Mishra & Yahya, 2007; So & Kim, 2009).

The digital social media tools we’re focusing here are increasingly used by both new teachers and students and are often called Web 2.0 and the following describes the functionality of these tools.

Technology characteristics

Wireless connectivity, hardware miniaturisation and central data storage are main «drivers» of Web 2.0. Web 2.0-tools make it easier to produce content together. File storage moving from local hard drive to the cloud simplifies sharing. This means that we see a proliferation of services that are based on relationships between people and we say that the media has become social. Social media is tailored for many-to-many communication and media content is primarily created by participants. Posting in such platforms generate an immediate dynamic from the audience. The audience access your work anywhere and anytime. And they can respond. They share, rate, like, tag or post comments to images, articles and other content. Digital technology (smart phones and the Internet) change the size, scale and dynamics of children, young people and adults’ social worlds. For the teacher it is therefore relevant to relate this to what new skills, knowledge, practices and competencies that develops. Everything from applying information to produce new expressions – and reflection of ideas are evolving.

Writing with pencil on paper is not very shareable and not searchable. Here, technology has provided affordances which cause a rethinking of the tasks and learning goals we set for our students. But it is not about finding one tool that increases learning outcomes in one learning objective. This involves a constructive process consisting of communication, learning and reflection.

Theoretical perspectives

No matter how we describe the generation of young people today (Selwyn, 2009), we meet pupils and students who have been exposed to lots of technology during their childhood. Their use of digital technologies can be seen as a media «ecology» where «more traditional media, such as books, television, and radio, are «converging» with digital media, specifically interactive media and media for social communication» (Ito et al., 2008, p.8). Usage is woven into the social contexts in which technology is integrated. Activities are created between technology and its users’ subjective intentions. This means that the technology will be a part of, and should be understood in the social context.

Consequently this fits into the teacher’s practices and their students’ self-regulated learning. A broader interpretation of knowledge and teaching requires a perspective where teaching and

learning takes place in very complex educational ecosystem (Shear, Gallagher & Patel, 2011, p.12). Educational and technological changes require a framework that emphasizes a number of factors related to teaching practice and student learning. A socio-cultural learning perspective emphasizes that knowledge is constructed through interaction. In this perspective, interaction and cooperation are fundamental for learning. It further highlights the context, environment and culture around the pupil. Although learning here occurs through targeted actions in a social and cultural setting, is not necessarily the consequence that students always have to work together – but that they have insight into related activities in their environment.

McLoughlin and Lee (2008) presents three Ps to describe pedagogy 2.0 adapted to our time and our network society. It is about “Personalization”, “Participation” and “Productivity”. The learners today have easy access to ideas, resources and environments that supports their learning interests and their progress occurs through personal needs and choices. This goes under the name “Personalization” which also relates to customising. The pedagogy must engage the learner in the social process of knowledge development (“Productivity”) instead of just letting them use the information and learning material as the teacher presents. The teacher must support connections, dialogues and links within and across communities and larger networks (“Participation”) for the purpose of sharing ideas, questions and to solve problems. The core of pedagogy 2.0 is to take advantage of Web 2.0’s strengths in relation to self-regulation an increased degree of socialization and interactivity, access to open environments and opportunities for easier use of peers. In a triangular model McLoughlin and Lee (2008) try to visualize a new pedagogy with the principles i) Personalization, ii) Productivity and iii) Participation.

As Selwyn (2011) states, it is not sufficient to see schools just as physical structures (buildings, corridors, classrooms). The totality of the learning session is important, “the curriculum, the activities that students engage in, students’ perceptions of the learning goals in the classroom, their social interactions, the teacher’s behaviour, and more” (Salomon, 1992, p.63).

Methodological framework

The methodological approach is based on a theoretical review, previous empirical data and our own experiences as teachers in teacher training courses. The previous empirical data includes respondents from teacher education enrolled in net based courses at Stord/Haugesund University College. 56 students (66.1% female, M age = 42.5 years) completed a survey which investigated experiences and behaviours with the use of desktop videoconferencing (in-service student teachers (n = 32) and master’s degree students (n = 24)). 11 of the students were selected for focus group interviews and we conducted observations based on the recordings from the teaching lessons. The survey was conducted in November and interviews were conducted later (February 2012). A group of students (n = 11) was selected (purposeful selection, (Maxwell, 2005)) and split into two separate focus group interviews (Kvale & Brinkmann, 2009), which were based on the survey data and conducted when the courses were completed. In addition to time and settings, age, sex and demographic variables were controlled to ensure that the selection was purposeful.

Discussion of findings

This article aims to discuss how teachers can design their teaching and learning activities in higher education in the ecology of Web 2.0 and social media. According to the introduction and theoretical aspects presented, we are using the three key points; participation, personalization and productivity to focus our discussion to contribute to developing new practices.

Participation

Our research indicates that students are learning without teachers. But this does not mean that teachers are unnecessary. The students appreciate teacher-involvement but it seems like the role and context have changed. Despite every student using their own device, our findings identify that students learning are social. McLoughlin and Lee (2008) state that more engaging, socially-based models for teaching and learning are needed. In our ICT-supported learning environments more than two thirds of our students report they prefer participate via chat (instead of oral talk). They participate in formal LMS-discussion-threads, open Twitter-streams and closed Facebook-groups. Some respondents indicate that using email is ousted by i.e. Facebook-communication. The degree of participation is richer in these kinds of Web 2.0-tools. The sender can see: who (how many) have read the message, if there are any reply-comments, or “likes” and he can keep control of how many “followers” he got. By allowing comments and annotations by others, such personal publications allow for social constructivist forms of participation. With a greater emphasis on teacher-student partnerships in learning, we must accept the learners’ productions, content, activities and contributions as part of the curriculum.

Our students find Web 2.0-tools like Facebook easy to use for learners to engage deeply with their peers. Findings from different student groups show that students who engage in such net-based activities, they learnt not only about the profession they are entering, but also about themselves as practitioners.

Personalization

Terms describing personalization like “learner-centred”, “self- regulated” and “responsibility of your own learning” are not new to teachers. But we find that the use of ICT add some reflections and need some extra decisions. Central to the development of personalization in this context is moving on from LMS’s, towards an approach that are more learner-centric (McLoughlin & Lee, 2008). Schools that make use of hybrid learning models find that using both the physical and the virtual learning environments to their highest potentials allows teachers to personalise the learning experience and engage students in a broader variety of ways (Johnson, Adams Becker & Hall, 2015), but our respondents state difficulties choosing a suitable platform for learning and communication. Quotes from colleagues like: “Should we use Google Apps for Education, Facebook or Fronter?” and “Do I have to teach net-based? Or, how much can be done on campus?” express insecurity but also an understanding of teaching in the 21st century.

Our findings are related to studies where some or most activities are recorded. Our surveys show that the students want to choose between live and recorded activities and lectures. This corresponds with the desire of learning anywhere and anytime. Interview also revealed that this self-regulation and flexibility also provides dilemmas, i.e. related to collaboration and the need for social communities. A detailed schedule with mandatory checkpoints is valued, for students to be deeply committed to the study.

Constructing personal learning environments (PLE) can help integrate formal and informal learning in higher education, to maximise the potential of the new tools to support learning by capitalising on the competencies and skills students bring into the classroom (McLoughlin & Lee, 2010). We find a broader understanding of the learning situation among our respondents. Teachers admit that “my teaching is a lot more than me”. Teachers and students are expanding their learning space, and incorporate YouTube, blogs, wikis, experts, peer-groups, etc. Establishing and developing such a community “adds a further dimension to participative learning by increasing the level of socialization and collaboration (...) by fostering connections that are often global in reach” (McLoughlin & Lee, 2008, p.17).

Productivity

Changing from students as consumers to producers has long been taking place in the focus of pedagogical practice in higher education. The shift to students as creators, is by NMC (Johnson, Adams Becker & Hall, 2015) described as a fast trend in Scandinavian schools for the next one to two years. Our research among teacher students since 2011 indicates that they are able to cope with the practical and technological issues. The technology is not an obstacle. This paves the way for increased productivity. They produce resources and share various contributions. We identify multimodal texts, hyperlinks, presentations, movies, blogs, comments, recordings from practice, etc. Our research reveals that students also establish their own channels “outside” the institution (i.e. Facebook-groups). A larger spectre of possible formats, are nevertheless also among our students perceived as difficult for those from a conservative tradition.

A challenge identified for the teacher is that students still are doing lots of other things while being taught. But several of these activities are closely related to teaching. We find students checking URLs and resources on Internet during lectures, and sometimes they share and contribute to the lecture with their findings. 25% of the students said they asked more questions in online meetings than in campus sessions and interviews did reveal, that the chat opportunity can be used to “ask questions we don’t dare to ask in an auditorium”.

Our research shows that students are capable of creating, producing and sharing ideas, concepts and knowledge. And they contribute with their inputs both spontaneous and when asked. This means we, as teachers, have to prepare for and organize our learning environments in line with this practice. Our reading lists, activities, tasks should be open and flexible to the students contributions, and the social constructed knowledge. Their creative productions can in this way, validate their own learning and knowledge.

Summing up

Collaboration and relationships is one of the pillars of Web 2.0 and social media. The main aim of this article is to make contributions to how teachers can design their teaching and learning activities in line with these perspectives. When the interaction between communication, technology and daily activities change, it provides opportunities to build good learning environment within the class but also outside their four walls. It also provides opportunities for pupils and students to create coherence in their learning efforts across various venues (formal/informal) and across studies and semester (McLoughlin, 2013, p.189).

Today's students have high expectations of how they should learn, they select technologies and learning environment that is tailored to their needs and they have a sophisticated understanding of how they can manipulate both technologies and learning environments to their advantage (Conole, De Laat, Dillon & Darby, 2008). Our findings related to the tree Ps indicate potential and challenges for teachers and institutions to cope with. The triangle (McLoughlin & Lee, 2008) is framing the complexity in a constructive way. Findings and discussions related to the characteristics of each of the angles indicate we have to change practice and task descriptions. This mean we have to implement our Web 2.0-pedagogy and design learning (environment and activities) which supports purposeful activities, possibilities for reflection – spaces and tools which facilitate communication and sharing of ideas and understandings.

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OPEN SOURCE LEARNING STREAMS IN SOCIAL MEDIA IN YEAR 11 MATH TEACHING

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Abstract

The students' use of social media during lessons and in group work is a general concern amongst teachers especially from secondary school and onwards. The blurred ecotones between private, social and academic life brought on by the always present online mobile technology makes utilization of social media in teaching a balancing act. On the one hand the teachers in this study welcome the possibilities for communicating, sharing and producing academically relevant products, and on the other hand they fear that the rhizomatic connection between what is academic and what is regarded as non-academic is disrupting the learning process. Hence, teachers take different measures in order for the ecotones to either separate or engage in fruitful synergy. In this study two very different approaches are taken within similar pedagogical designs in a highly comparable context. In theory the outcome of the pedagogic design should be the same but in practice the two teachers achieve very different results. The study utilizes the deleuzean notion of 'interest' and 'desire' and problematizes the common use of 'motivation' in pedagogy. The study analyzes what appears to be a conflict between the institutionalized 'interests' of the educational system and personal 'desires' of the student. In one case the institutionalized interest and the personal desire of the student share a significant intersection; whereas the other case shows a clash of 'interest' and 'desire'. The study also shows a clash between content driven teaching and learning driven teaching. Finally the study shows that if a pedagogic design is imposed upon a teacher without his acceptance or full understanding of the design then the outcome is questionable. The study suggests a different approach to motivation that acknowledges that the process of learning is a desire of 'becoming' not the 'pleasure' of satisfaction through entertaining activities.

Introduction

At the school, where this study was carried out almost every student bring their own devices to class. For the most part the students live in a state of omnipotent onlineness where postponed replies in social media is considered impolite (Hansen, 2011) therefore controlled and restricted use of social media in particular and smartphone in general result in conflicts. The teachers at this school take different measures in the fight for getting the students attention; some teachers are very proactive, they collect smartphones in the beginning of classes and so forth, while other teachers resignate in inaction. But for the most part the teachers try to incorporate social media in the pedagogical design (blogs, Google drive,

socratic etc.). The incorporation of social media is done in many ways; one is to create intrinsic motivation (Ryan & Deci, 2000) through accommodating to the means of communication that the students use in their private lives, another is to try to move the academic tasks into social media. In both cases the use of technology is blurring the ecotones¹ (Paasch, Henningsen & Levinsen., 2014) between academic and non-academic life. The blurring of ecotones brought on by online, personal devices is a general concern in this study. Case 1 shows a teacher (referred to as teacher 1) who tries to utilize the academic affordances of social media, while case 2 (referred to as teacher 2) tries to maintain a well-defined ecotone between private and academic. In this study social media has the role of; hand-in folder, feedback channel and assignment distribution. It is merely a tool that is in everybody's shared repertoire (Goodyear, Casey & Kirk, 2014) and not so much an attempt to create extrinsic motivation through accommodation to youth culture.

Research design

The epistemological point of departure in this study is critical realist (Bhaskar, 2008). Critical realism opens a convenient gateway between realist and interpretivist epistemology. It is convenient if you believe that what you investigate into is not entirely recognizable through quantitative data; but on the other hand it is not a completely socially constructed either. Critical realism offers a way of looking at complex human interaction without struggling with the shortcomings of naïve realism and the shortcomings of social constructionism. Critical realism makes the distinction between the intransitive and the transitive dimension. The intransitive dimension is ontologically given; it exists unheeded of our knowledge of it. The transitive dimension is defined by our epistemologically determined knowledge of it. The intransitive dimension constitutes itself through a layered ontology. This layered ontology is stratified into layers (atom, molecule, physics, biology etc.) that make an experienceable 'emergence' possible. The intransitive dimension is furthermore divided into three domains and an infinite number of layers according to the context (Elder-Vass, 2007). This study investigates and compares different mechanisms in the domain of the real that cause effect in the domain of the empirical that emerge for us to witness.

The method is action research, abductive intervention design and ethnographic observation. The action research cycle is initiated by a planning conference, where the teachers and the researches benefit from each other's knowledge and experience. During the planning conference we define the problem and design the intervention on the basis of a shared abstraction that lead to a concrete abduction. The success of the abduction is relying on the shared knowledge and experience of teachers, researchers and the students' ability to acknowledge and act with in the pedagogic design of the invention. The outcome of the planning conference is a syllabus for the series of lessons in question. In the period between the planning conference and the actual teaching, the syllabus is qualified further by the teachers and researchers. During the actual lessons the researcher observes the students

¹ Ecotone: the border between two ecosystems, forest-field, river-brink. Used as a metaphor for the borders between academic life and private life. Technology that contains both ecosystems are prone to blur the ecotones (for good and bad).

interaction, interview students and collect other relevant data. After that the data is analyzed and the results are reported back to the teachers for the purpose of evaluation and developing the pedagogical design further. This study was done during the second action research cycle within the same context. Furthermore the intervention in this study is a part of a longitudinal research project funded by the Ministry of Education².

The design utilizes prior knowledge of the ‘Open Source Learning Stream’ (Kjærgaard & Sorensen, 2014a) which indicates that learning in an open stream of learning instances is creating a shared sense of community and connectedness amongst learners (Siemens, 2014). The open source learning stream can manifest itself in various ways (Kjærgaard & Sorensen, 2014):

1. Synchronous or asynchronous individual learning log on smartphone;
2. Synchronous shared learning stream in a rhizomatic, digital network (twitter, facebook, edmodo);
3. Asynchronous shared learning stream in a rhizomatic, digital network (LMS discussion forum).

In this case the pedagogical design utilizes the second manifestation of an open source learning stream. The idea is that the shared, open learning stream in a secure learning environment would create a ‘desire’ to achieve ‘connectedness’ (Bliuc et al., 2011), take part and gain ‘positive’ identity in the learning stream. ‘Positive’ is identified as a student identity that is ‘connected’ to the learning stream and contributing to achieving the shared learning goals by either asking or answering questions or by expanding the path towards the shared learning goal.

Interest and desire

In our experience the term ‘motivation’ is somewhat problematic. Instead we introduce the philosophy of Deleuze and Guattari and their notion of ‘desire’ and ‘interest’ (Young, 2013). Interest and desire are related to what we in pedagogy would call motivation. ‘Interest’ is also closely related to the management idea of motivation through goal oriented, rational thinking (Styhre, 2001). Therefore we will discuss the pedagogical term ‘motivation’ in relation to the philosophical terms ‘desire’ and ‘interest’ in order to explain why we opt out the notion of ‘motivation’. In pedagogy we divide motivation into intrinsic motivation and extrinsic motivation (Ryan & Deci, 2000); intrinsic motivation being the student’s immanent drive towards something, extrinsic motivation being the outer actions taken to stimulate intrinsic motivation. In our experience the problem with the notion of motivation as a pedagogical term is that it removes focus for the academic tasks and points out things that the teachers must do or change to motivate students. Furthermore motivation theory externalizes the gauge for levels of motivation. Methods for determining levels of intrinsic motivation could

² Link to The Ministry of Education’s description of the longitudinal project:

<http://uvm.dk/~media/UVM/Filer/Udd/Folke/PDF13/Maj/130527%20Elevernes%20egenproduktion%20og%20elevinddragelse.pdf>

be: ‘free choice test’ (Ryan & Deci, 2000) where learners are presented with a set of choices one being the target task. The learner’s intrinsic motivation is then, somewhat crudely, measured by the amount of time he/she spends on the target task and by that the motivational quality of the task.

“...intrinsically motivated activities were said to be ones for which the reward was in the activity itself.” (Ryan & Deci, 2000)

In that sense intrinsically motivated activities cater for immediate learner needs often materialized through entertaining activities (edutainment etc.). Such activities are related to a form-oriented teacher (‘level 2’) (Biggs & Tang, 2011). A ‘level 2’ teacher is a teacher who is, according to Biggs, very interested in evoking intrinsic motivation through entertaining teaching activities. This teacher is very much into developing his or her own teaching techniques and methods, often through the means of technology. A ‘level 2’ teacher hasn’t yet asked himself; ‘who is learning what from these activities’, according to Biggs. In connection to the ‘level 2’ teacher is the ‘level 1’ teacher, who is focused on content and the ‘level 3’ teacher how is focused on learning. In that sense the progression goes from content-centred to form-centred to learning-centred teaching. The latter being a symbiosis of the two first. Intrinsic motivation is related to the ‘level 2’ teacher and to whether the student enjoys the teaching or not. This study tries to create a plateau for ‘level 3’ teaching activities that focus on learning processes and not on entertaining the students. Intrinsic motivation is often evaluated through self-report or satisfaction-surveys.

“The other common approach to the measurement of intrinsic motivation is the use of self-reports of interest and enjoyment of the activity per se (e.g. Ryan, 1982; Harackiewicz, 1979)” (Ryan & Deci, 2000).

This brings the student’s immediate enjoyment in focus and not his/her learning process. In motivation theory it is believed that enjoyment and learning outcome should go together but in our experience this line of thinking often leads to pedagogic designs that lean more towards entertainment than education and whilst the activities might be amusing the learning outcome is often minimal. The students in this study took part in another full day intervention where they should do math using LEGO mindstorms robots. Most of the students were motivated and had fun but they struggled to recognize the academic potential in the activities. After the teacher pinpointed the academic elements in the activity one student’s utterance encompassed most students’ experience:

“we could have learned the math in 20 minutes, if it [LEGO mindstorm activity] was about math it would have been easier to learn through normal math tasks – but it was great for getting to know each other” (female student in year 11 class)

In our experience the notion of both intrinsic and extrinsic motivation moves focus away from the academic task at hand. In some cases that is properly good but in the case of this study it is important for both teacher and students to have explicit math-oriented goals. So the challenge is to evoke the students' desire towards achieving the academic goal. In Deleuze and Guattari's theories on desire and interest they claim that desire comes: *not from need or want but from plane of consistency* (Styhre, 2001). 'The plane of consistency' in a student (or any human being) is part all things unconscious, part individual identity and part resources (Deleuze & Guattari, 1987). It is from 'the plane of consistency' that ideas arise, feelings emerge and desires materialize in to actions or thoughts. The plane of consistency is the foundation for the students' 'unconscious drives':

"...it [desire] does not refer to my conscious desires—to get rich, to get laid, to get a job—but rather to the state of the unconscious drives" (Smith, 2007)

When desire is thought of as an unconscious drive it will be pure luck to evoke desire by constructing learning activities that learners evaluate positive and claim to enjoy according to the means of intrinsic motivation. Especially, in an educational system (the Danish) that have chased motivation (intrinsic and extrinsic) as a key factor for learning for decades. The struggle for learning is taken over by the fear of boredom. If learners already have pleasure as a given circumstance in the learning process, without struggle, then pleasure, needs and satisfaction loses its effects and meaning (Styhre, 2001). Pleasure and desire are to very different things according to Deleuze; pleasure is a satisfied 'being', where desire is 'becoming' (Young, 2013). Learning is in itself a process becoming. The main difference between intrinsic motivation and deleuzean desire is that desire comes from immanent resources (plane of consistency); the students experience, resourcefulness, identity, unconscious drives, recognition in group, while intrinsic motivation in Deci's interpretation is thought of as a rewarding emergence that comes from the activity itself. The philosophical notion in this study is that desire to learn comes from prior learning experiences and leads into new learning experiences, hence entertainment, satisfaction of needs, etc. in itself cannot evoke desire. We are not trying to accommodate to the students use of social media we are merely using Facebook because it is a convenient plateau for connectedness.

The other side of motivation, the extrinsic motivation, is just as problematic in pedagogy because the interest, in a deleuzean sense, that extrinsic motivation often holds is an external one; to get a better grade, to understand geometry, to get a job, to learn in general etc. All these 'goals' are goals that we as educators believe all students should strive for but in reality the students' desires might be totally different. In this study a disaffected student says: *'my mom and dad say that I won't need math later in life, so I don't bother to struggle with it'*. The interest that the teacher tries to impose on the student is challenged because her parents are offering another interest and the students desire to learn math is lost in a conflict of interests. The interest that her parents offered implied fewer struggles; hence that interest was more attractive because 'struggle' is regarded as both unnecessary and unpleasant according to this student.

“The interest of a student is not build on his [or her] own will and desire but on the social formation of education.” (Smith, 2007)

So in this study we tried to analyze; what is interest and what is desire and how can we work with desire within the given framework of external interest. On the basis of that the notion in this study is that desire comes for empowerment and empowerment comes from being able and knowledgeable, hence we strive to design lessons that empower the students to learn and through that gain desire to learn more – motivation becomes the ends not the means.

The Context

The study was carried out in a school especially for year 11 students (10. Klasescenter³). The School is attended by 220 students; they are all in the same key stage, all at approximately the same age (16/17 years). The syllabus describes a series of math lessons (5-7 lessons) on geometry (Pythagoras and Heron) in which the students must use Geogebra⁴, smartphone and interaction platform (Facebook or Google). The task for the students is to take pictures of geometric shapes in their surroundings, upload the pictures to Geogebra, do calculations (circumference, area etc.). After they have done the calculations they must formulate a geometrical task for their classmates on the basis of their pictures. The task and pictures are then uploaded to the interaction platform. Each group must do at least their own task and one of their classmates' tasks. The technology didn't cause any problems. The students were familiar with Geogebra, to some extent, and they had no difficulties taking, uploading or sharing pictures. During the planning conference some of the teachers were reluctant to incorporate Facebook as an obligatory element because they thought that the 'legitimate' use of Facebook would trigger 'illegitimate' use of Facebook. Therefore we made the choice of Facebook as interaction platform optional.

Data analysis

Since this study is a part of a longitudinal, ethnographical study of students as 'learning designers' (Levinsen & Sørensen, 2013) the main empiric data is primarily field notes from observation and semi-structured interviews with students. However the empiric data also include the stream in the student's math-Facebook group and the documents from the planning conference. The data in the Facebook group contains pictures of geometric figures from the Geogebra task and the corresponding classmate-tasks in the comment section. The field notes from the observation report from two very similar situations; two male math teachers, same number of years' experience, same number of students in class (18), students of same age and same key stage, same learning goals, similar classrooms, similar technology, observed in the same period (October 2014). However the observations in the two classes were rather different.

³ Year 11 is an optional addition to the mandatory schooling (GSCE) in the Danish school system. Year 11 focuses on preparing the students for vocational or 6th form education.

⁴ Math tool: <http://www.geogebra.org>

Teacher 1 decided to use Facebook for the learning stream and for the distribution of classmate tasks. He decided that the students should pick a classmate-task of their own choice.

Teacher 2 decided to use a shared Google doc for distribution classmate-tasks and left it to the students to decide which service they would use for sending the pictures that went along with the classmate-task to the appointed opponent group. Teacher 2 had made a predefined distribution of classmate-tasks which meant that the students had no choice between the different classmate-tasks.

Research findings

Even though the two series of lessons are seemingly alike what actually happened in the classroom turned out to be quite different. In teacher 1's class focus is on evoking desire through connectedness. In his class the students were inspired to engage in the activities. They quickly began their own part of the math task and shortly thereafter they posted pictures and classmate-tasks in the Facebook group. After one round of activities some of the students began to experiment with more difficult and complex geometric figures from their surroundings. All students were active because they could choose geometry tasks at their own level and create just slightly challenging tasks for their classmates. So all students could take part and all were challenged. Teacher 1 could follow the progression in the Facebook group on his smartphone and give feedback in the comment section or by 'liking' the task or the solving of a task.

In teacher 2's class the students were a little hesitant towards the tasks. They didn't really understand why they should take pictures and do math on something they might as well have drawn. They requested 'real math tasks' and when it came down to solving the classmate-tasks some of the tasks were too difficult for some opponent groups and some were too easy for other groups. So the predefined regulation of the task assignment didn't work. Some students were done too quickly and others couldn't solve their task at all. When we interviewed the students in teacher 2's class they said that they used Facebook to send the pictures to their classmates which means that they were on Facebook, no matter if the pedagogic design dictated it or not. The technology that teacher 2 put to use had no apparent purpose which the students reacted to as follows:

"It is confusing to do math this way, it doesn't make sense to use google" (T2, Student 4, female)

"I could do the math easier with a pen and paper" (T2, Student 2, male)

In teacher 1's class the students react a little differently, even though they also point out that they could do the actual math bit of the tasks quicker with pen and paper.

"When I do math in Geogebra I have a feeling that I can easier use what I learn in other contexts" (T1, Student 1, male)

“It is nice that you decide which task you want to solve. It is more fun that solving tasks from a book” (T1, Student 2, female)

The main function of technology in teacher 1’s case was to share classmate-tasks and the solving of classmate-tasks and try out new ways of feedback and decision-making. The main function of technology in teacher 2’s case was to control task distribution. So in that sense teacher 1 is addressing ‘desire’ and teacher 2 is addressing ‘interest’.

Teacher 2 was very specific about expressing the external interest of the assignment in the sense that teacher 2 used an upcoming evaluation as a motivational leverage to get the students to be more active. Teacher 2 spent quite a lot of time talking to about their lack of enthusiasm and that they would have to work harder or else the evaluation might not be as positive. Teacher 1 spent all his time talking about geometry and helping the students to create exiting tasks for their classmates.

Discussion

The study is an example of Everett Rogers’ claim that you can implement technology without being innovative; however it is hard to be innovative without technology (Rogers, 2010). Teachers 1’s pedagogic design seemed to be more fruitful than teacher 2’s but the reasons for this lies properly not only in their application of technology. There may be many other reasons; the teacher’s connection to that specific class, the difference in class culture, the teacher’s understanding of and commitment to the common goal of the intervention in the longitudinal study. The reservations towards taking advantage of blurred ecotones in social media might have forced teacher 2 to compromise his own belief in the sense that his choice of technology might have been more a case of choosing the lesser of two evils rather than a proactive choice of his own. If a teacher doesn’t believe in the method or technique of teaching that is requested of him then the result is often not so good. The mere fact that the intervention design is imposing a design for teaching upon the teachers is a source for bias.

Conclusion

The study shows that you can engage the students’ desire through connectedness by academic tasks. If the pedagogic design is allowing the student to make academic decisions on the basis of his or her abilities then it is desirable to take part in the activities. If you take advantage of blurred ecotones in social media, you can separate the affordances of the media that cater for academic tasks from all the other types of communication that social media makes possible. In this study Facebook was the mechanism that made the pedagogical idea of a learning stream possible. The study shows that; the learning stream, the selection of which tasks to do, the fast feedback mechanisms, the documentation of the process and the general feeling of connectedness wouldn’t have been possible without reflected use of social media. On the other hand the study also shows that you can easily incorporate technology for the wrong reasons. During the planning conferences it became evident that now all teachers condoned the initial description for the activities, therefore we created a window of choice of communication platform. The option to pick another platform lead to teacher 2 picking a platform that had

different affordances then the intervention needed, hence the technology was at best redundant and at worst a hindrance.

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WHAT DO STUDENTS SAY ABOUT EPORTFOLIOS: UTILIZING SOCIAL MEDIA TO EXPAND LEARNING SCENARIOS

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Abstract

The purpose of this research is to understand how students value implementing open source ePortfolios as a 21st century learning strategy. This paper will present survey findings of current students and alumni about valuing ePortfolios for connecting formal and experiential learning, and for professional preparation. One professional program at the University of Oregon worked with ePortfolios based in an open source blogging platform, and which were integrated throughout the curriculum. Findings suggest that the inclusion of open source social media ePortfolio approaches to learning are valued by students for their support of making learning visible across the curriculum and in connecting co-curricular learning and professional development. This seven-year project reached hundreds of students, suggesting possibilities for an integrated technology approach to education and expanded learning scenarios in a global learning environment.

Introduction

The University of Oregon has been working with ePortfolios in graduate and undergraduate professional programs since 2004. Students create and maintain learning ePortfolios that connect curricular and co-curricular learning and achievements, provide evidence of the development of professional skills, and a means to critically reflect and analyze about their learning progress while embedding technology-rich strategies in research and professional practice. Findings from the project suggest that “ePortfolio learning” fosters habits of mind conducive to 21st century skills and are fundamental to addressing challenges that higher education faces as alternative, technology-rich educational structures compete with traditional classroom learning environments.

Context for the project

Daniel Pink (2006) wrote that: “The future belongs to a very different kind of person with a very different kind of mind – creators and empathizers, pattern recognizers and meaning makers. These people – artists, inventors, designers, storytellers, caregivers, consolers, big picture thinkers – will now reap society’s richest rewards and share its greatest joys” (p.1). Pink further notes that,

It is an age animated by a different form of thinking and a new approach to life – one that prizes aptitudes that I call “high concept” and “high touch.” High concept involves the capacity to detect patterns and opportunities, to create artistic and emotional beauty, to craft a satisfying narrative, and to combine seemingly unrelated ideas into something new. (p.2-3)

The ability to synthesize, communicate, collaborate, and create something new are part of the range of so-called “soft skills” which both employers and education policy makers are now focusing on in identifying future education needs.

The American Association of Colleges and Universities suggest that ePortfolios can play a critical role in supporting students, faculty and institutions as a navigational strategy for 21st century learning outcomes. Central to ePortfolios is the process of reflecting on the growth of one's knowledge and capabilities over time with an emphasis on metacognition by intentionally providing structured time and space for learners to consider and document the process of learning and not just the product (Brown, Peterson, Wilson & Ptaszynski, 2008).

And, because they enable students to authentically represent their own learning in a way that makes sense to them and encourages them, students take responsibility for their own learning (Light, Chen & Ittelson, 2011).

U.S. employers complain that today's young adults are not equipped with the skills they need to succeed in the 21st century workforce. In 2006, the Conference Board and three other organizations issued a report, *Are They Really Ready to Work?* Based on a survey of several hundred employers, the report concluded by calling for more focus on the development of such “21st century skills” as critical thinking, problem solving, creativity and communication. At the same time, as the *The Wall Street Journal* reports, increasingly employers are asking to see evidence of job candidates' web presence, rather than a resume:

Companies are increasingly relying on social networks such as LinkedIn, video profiles and online quizzes to gauge candidates' suitability for a job. While most still request a résumé as part of the application package, some are bypassing the standard requirement altogether. (Silverman, 2010)

Project description

Building on the need to address these changes, the *ePortfolio Project* began with the idea of creating and fostering a digital neighbourhood, or “commons,” as the point of daily departure and return, where learning is fostered through sharing thoughts, ideas, events, and professional development. The project sought a way in which what was happening in classes could be shared and made visible, and to generate a forum for students and faculty to share how they were extending their thinking and applied practices to outside the classroom. The project also sought to create a virtual community where students articulate value, and where students, faculty, and professional partners foster connections between curricular and co-curricular work, and to make evident how students were transferring skills and knowledge across a range of experiences.

In the Arts and Administration Program at the University of Oregon, students create and maintain learning ePortfolios in a customized WordPress blogging platform throughout their graduate program. Faculty make use of the system to connect student learning ePortfolios with instructional weblogs, fostering a community learning environment conducive to student-centred learning. Students have the highest degree of control over the privacy of their ePortfolio and all the materials they publish on it – from fully private, to password-protected, to fully public ePortfolios that are searchable by Google.

Students are required to post their academic plan, and are encouraged to utilize the system in order to provide evidence of achievements, and to document their growth over time. In this way students are embedding habits of reflection, evaluation, and documentation. Students are also encouraged to document and provide evidence of their professional growth through their internships, practicums and other professional activities, and are encouraged to engage as thoughtful digital citizens. At the end of the term, students then reflect on their course learning objectives, and analyze how they participated in working towards their objectives, identifying transformative moments, and discussing and providing evidence of how their thinking has changed relevant to their future growth.

The author conducted a survey in March 2013 to assess how students use their ePortfolios, and to discover what they value about learning in and through ePortfolios in an open source environment. The survey was sent to current graduate students and alumnus via Qualtrics, an open source online survey platform. Of the thirty-two respondents, eighteen were current students, and fourteen were alumnus. The survey revealed both anticipated as well as unanticipated responses, and revealed that students were using their learning ePortfolios in support of project goals, but also extending the ways they used and applied both the product and process in unanticipated ways. The survey found that respondents use their ePortfolios for a variety of purposes, including posting assignments and reflections on readings and class discussions. Students also use it for aggregating their academic resources and materials, documenting their internships and practicum, as well as their graduate research. Many students use their learning ePortfolio for career advancement, offering it as a link to prospective employers.

What do Students Say about ePortfolios: Utilizing Social Media to Expand Learning Scenarios

Lori L. Hager



Figure 13. Student use of ePortfolios for classes and coursework

Respondents noted that learning to present themselves online through utilizing current web tools was a significant benefit to their participation. Also valuable was the ability to aggregate all their materials and resources, and to track their academic progress. Many respondents reported that their use of ePortfolios in the WordPress environment extended beyond their use in their graduate program. Students appreciated the skills that they learned through using ePortfolios for its relevance to their current jobs and to their internships. One respondent noted, “I ended up using the same blog software to create a program blog, and we now have high school student teachers blogging to document their experience in learning to teach art.” Others note that they apply what they learned to set up websites for their internship sites, and that they manage weblogs at their worksites. Students have also been invited to review professional web resources and to serve as guest bloggers on national professional platforms.

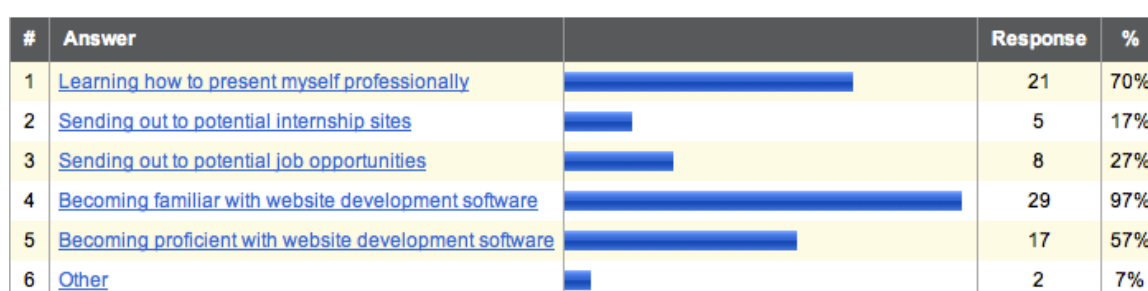


Figure 2. Benefits of showcase ePortfolios

When asked if students used their ePortfolios beyond the minimum course requirements, students replied that they use it to aggregate resource materials, to document co-curricular projects that they are working on, and that they often use these skills at work. Many students make use of their proficiencies to create and document community-based and entrepreneurial projects that they are developing, or in demonstrating how they are connecting their research and professional practices through research weblogs.

When asked about the benefit of using ePortfolio, in addition to increasing their digital literacy, 29% of the respondents valued making learning visible, and demonstrations of achievement, and 36% of respondents valued developing habits of mind, such as critical reflection and self-evaluation.

#	Answer		Response	%
1	Habits of Mind: Critical Reflection, Self-evaluation, etc		16	50%
2	Learning how to use wordpress		25	78%
3	Using social media		7	22%
4	Making learning visible - demonstrations of achievement		16	50%
5	Having a visible record of my work over time		15	47%
6	Blogging and digital citizenship		7	22%
7	Other		2	6%

Figure 3. What would you consider to be the most important benefits of using ePortfolios

Respondents also noted that participation in learning ePortfolios assisted them to increase skills in integrating technology into program development and documentation – an essential skill for today’s workforce – and found the skills they learned to be highly relevant to their job preparation and growth. What is most interesting here is the recognition of how critical are the habits of mind, an area that has the critical implications in the future of learning.

Summary and discussion

While the small sample size of this particular survey makes it difficult to generalize about the impact of ePortfolios in helping to push the boundaries of learning outside the classroom, the results may be useful for discussions about the possibilities inherent in the use of new technologically-driven pedagogies for opening up learning environments. After working with hundreds of students in utilizing learning ePortfolios, it is apparent that ePortfolios support a more student-centred pedagogy that thrives in experiential, and experimental, education. The proliferation of education technologies liberates education from the traditional school day and traditional pedagogical and classroom structures. Advances in technology are allowing ePortfolio applications to demonstrate that ePortfolio learning is not about the technology, but about the learning and knowledge generation. EPortfolios capitalize on the social networking behaviours of entering students, in support and enhancement of meaning making, and multi-modal communication and interaction. ePortfolios helps to harness skill sets necessary for the next generation of meaning makers, such as critical thinking and collaboration, and to make learning (and knowledge generation) visible to students, to peers, to faculty, and to professionals.

Technology already pervades every classroom in the United States, whether it is the use of content management systems such as blackboard, clickers, mobile apps, or YouTube. The U.S. Department of Education (USDOE) is embracing the application of technology education in 21st century schools. The USDOE publication, *Transforming American Education* (2010) summarizes the national education technology plan.

President Obama has called on our nation's governors and state education chiefs have begun to develop standards and assessments that measure 21st-century competencies and expertise in all content areas. Technology-based assessments that combine cognitive research and theory about how students think with multimedia, interactivity, and connectivity make it possible to directly assess these types of skills. This can be done within the context of relevant societal issues and problems that people care about in everyday life. (p.vii)

This mandate, considered in conjunction with contemporary educational theorists, posits integrated approaches to learning within technology-rich environments. Henry Jenkins (2004) promotes an “ecological approach” to learning with technology, asserting that,

Rather than dealing with each technology in isolation, we would do better to take an ecological approach, thinking about the interrelationship among all of these different communication technologies, the cultural communities that grow up around them, and the activities they support. (p.8)

In the age of standardized testing, it can be difficult to argue for and advocate for making learning visible, as it implies risk and subsequently failure. However fostering “noble failure” is needed in our nation’s education:

What we need in our schools -- what we don't have enough of -- is an environment where it is okay to fail, because that environment will make it okay to try. And, ironically, if failure is fun, if it is productive and noble, and if it becomes little more than permission to try again, our students will succeed more. (Landesman, 2010)

Where a leading design company has the motto “Fail Often and Success Sooner”, (as cited in Landesman, 2010), it may be in everyone’s best interest to foster an environment of “high concept” and “high touch” (Pink, 2006), where the ability to reflect, iterate, and revise is the best evidence of capability and success in the workplace.

EPortfolios can provide a means to both practice and to demonstrate these transformations in thinking and learning. The ability for students to document and demonstrate what they learned from each iteration, and their problem-solving process, can leads to transformations in growth and learning. As educators, fostering learning in this way not only has the potential of preparing students for the new 21st century workplace, but of opening up the learning landscape to fuel global education rich in international connectivity.

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DIGITAL IDENTITY AND PERSONAL LEARNING NETWORKS (PLN) IN A PHD RESEARCHERS COMMUNITY

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Abstract

The Web 2.0 has been increasingly used by the academic community – teachers, students and researchers – to create, stimulate and expand learning in an informal way, even when knowledge is acquired in a formal context. The appearance of emerging environments and pedagogies has enabled the introduction and adoption of new practices and behaviours of individuals in the university academic context. In the context of lifelong learning and as a complement to formal learning, there is a new reality for the 21st century researchers – the personal learning network. This research project addresses issues related to the researchers' digital identity in the field of Online Distance Education and eLearning and their personal learning environment, researching the genesis, management and dynamics of the personal learning network of each member in a community of researchers. Within this background, this research aims to analyse how a community of researchers uses social networks to deepen their knowledge, as well as to understand how they create, manage and stimulate their social networks to acquire knowledge based on their contacts.

Introduction

With the evolution of the internet, the Web 2.0 is a platform for creating, sharing and constantly modifying content, user-centric, allowing both the interaction and communication as well as the creation of networks. This evolutionary phenomenon changed some fundamental aspects in how individuals act and behave in the Network: how to connect, interact, share information, make purchases, socialise, learn and work. In this context, there are several emerging environments that define new practices and behaviours of the individuals. It is also in this framework that the Web 2.0 has an increasing use by the academic community – teachers, students and researchers, to create, stimulate and expand learning informally, even when knowledge is acquired in a formal context. It is also relevant to mention the importance of digital literacy by the members of the academic community, which enables, among other actions, the creation of networks of social connections, which, in turn, allows a collaborative learning in an open network.

Collaborative learning through a network of social connections depends on a correct use of the digital media by researchers (Castells, 2001). In this sense, there is a tendency to optimise learning with the use of digital technologies at the disposal of the individual, through the network. The evolution allows an awareness of the need to promote new forms of learning, collaboration, and dissemination of the work developed, as part of their digital presence, both at a personal level, as well as an academic and professional level (Costa & Torres, 2011). The use of digital media and sharing in the same spaces allows the construction of a Digital Identity. There is an increasing presence of the researcher in the spaces of the web, where they do research and share knowledge, through social networks, blogs, wikis and other appropriate spaces for sharing. This process does no longer depend only on the researcher him/herself, but on the whole network of individuals that make up the network and that interact with them. It is, thus, each one's responsibility to manage their presence in online spaces, both public and private (Alexander, 2008; Cranor, Reagle & Ackerman, 1999; Warburton, 2010; Esposito, 2013a; 2013b).

In short, the evolution of technology creates new challenges to education and researchers, as we nowadays live increasingly networked. The network is composed of individuals who are part of our everyday life, who we share interests, resources, thoughts, links, insights and jokes with, among many other things, but the most important thing is that they enrich our professional, academic and personal life. This sharing is taking place, most of the times, through social networking and Web 2.0 tools, which motivate and facilitate the edition, simulation, reviews, sharing of text, sound, image and video, by promoting and valuing the Personal Learning Environment (PLE) and a networked learning (Mota, 2009b), enabling a social learning which is collaborative and open, through their Personal Learning Network (PLN) (Brown, 2002).

This study intends to research a community of researchers, in order to analyse how they use social networks to deepen their knowledge, how they create, stimulate and sustain their social network, to get knowledge from the contacts they establish.

The PLN of a community of researchers

The present study thus seeks to contribute to the understanding of how a community of researchers builds, maintains and nurtures their personal learning network, in a useful way to their learning process. In other words, how the PLN can be the means for the researcher to disclose his/her identity in the network.

As an effective contextualisation of the problem, the study involves the analysis of three concepts: digital identity, personal learning environment and personal learning network. It seeks to answer the following main question: How does the researcher create, manage and stimulate his/her digital identity to build a Personal Learning Network (PLN)?

This main question is intended to address the following objectives:

- to identify the PLN of researchers in the research community, in order to identify how they handle its construction, management and dynamics;
- to identify the researchers' digital identity;
- to define how researchers identify and create the online relationships in their PLN;
- to identify the structural factors that enable collaborative learning through the PLN.

Digital identity

In a society that lives increasingly networked and in constant online interaction, it becomes necessary to have an awareness of digital presence. In the context of this study, the researchers mark their digital presence through their sharing, collaboration and dissemination of their work through the social network(s). Through the network and what is shared, each person will disclose their digital identity. Oliveira and Morgado (2014, p.469) assert that “the digital dimension of identity is understood as the total information about the individual, from credentials that allow access to the closed system, to the representation of the complex “I” in an open digital space[16]”. The concept of Digital Identity is recent and derives from the practices that individuals have been developing on the network. It's an important element because it is the reflection of the personal, academic and professional life of the researchers.

The digital presence of researchers is a process that does not depend only on researchers themselves, but also on how they create their network, in a participatory manner through sharing and collaboration or simply by receiving what members of their network share. Thus, researchers must know how to manage their presence in public and private online spaces, and this represents another skill acquired by digital literacy (Oliveira & Morgado, 2014). The digital presence is considered by some authors (Costa & Torres, 2011; White, 2008) in the dualist perspective of the “self”, by its dynamics and presence, with the possibility of considering the “self” as a visitor or resident (White, 2008).

Personal Learning Environment

The fast development of Web 2.0 tools creates new challenges for education and research, as we nowadays live in a network. With this reality emerging environments arise, which are ubiquitous for the development and exploration of a true Personal Learning Environment (PLE).

The concept of Personal Learning Environment (PLE) appears for the first time in 2001, in a text by Olivier and Liber (2001) entitled Lifelong learning: the need for portable personal learning environments and supporting Interoperability standards, whose authors integrate the institutional context of learning with a peer-to-peer model that should be focused on a personal and lifelong learning (Mota, 2009b). Since that date, there have been a few studies on the topic and even in 2010 there was a conference focused on PLE, with the aim of creating a space for researchers and professionals to exchange ideas, experiences, research around the development and implementation of the PLE, including the design of environments, as well as

sociological and educational issues, their effectiveness and convenience as informal learning spaces. Since 2010 this conference is annually held. According to Gallego and Chaves (2014), there are few studies on PLE, with the majority of texts/papers being submitted to The PLE Conference, the number of theses on the topic is even scarcer.

Since it is a recent concept, the definition is not yet consensual among the community of researchers. In the diversity of definitions that were developed around the concept of PLE, there are, however, common elements and one may consider that there is a degree of unanimity when it is stated that it is an environment controlled by the individual, based on diversified digital resources, associated with a given space, requiring an identification of the individual (i.e., to access certain features, an individual/personal register will be required), promoting lifelong learning. This allows the individual the ability to increase or decrease the number of resources at their disposal for learning, and finally another common element is that it consists of a social software that enables the interaction among a network of contacts (Johnson, 2008).

The PLE has emerged in recent years through open platforms and research work has recognised the importance of informal learning through social software and by successive recognition of the importance of the update in the perspective of lifelong learning (Adell & Castaneda, 2010; Castaneda & Adell, 2013; Mota, 2009a).

According to several theoretical studies, the PLE allows the individual to continually update their knowledge, in a prospect of lifelong learning (Gallego & Chaves, 2014) and, therefore, it is, at the same time, a demand and a need in a world that is constantly networked and where technology is used in everyday life. Thus, the individual uses a set of tools for communication and interaction in various tasks, activities and situations, in accordance with their needs and to be the actor of a learning, be it formal or informal.

Castaneda and Adell (2013) describe the PLE as being composed of three dimensions and interrelated tools:

1. reading tools and strategies, in which the sources of information provide certain information in the form of object or artefact;
2. reflection tools and strategies - this space refers to environments or services where one can transform information (places to write, comment, review, recreate and publish);
3. relationship tools and strategies: the environments where there is a relationship with the other individuals and where learning takes place.

Personal Learning Network

The Personal Learning Network (PLN) is the social dimension of a Personal Learning Environment. For Castaneda and Adell (2013) the PLN emerges as a relationship tool and strategy, which consists of environments where the researcher relates to others and that by means of this relationship, feedback and interaction that may exist, there is a production of knowledge, and therefore there is a network of learning.

The PLN is defined by the connections that the researcher establishes through the means available and at their disposal, with the purpose of improving mutual learning, through feedback, ideas, documentation, new contacts, thus building a network of learning and acquisition of new knowledge.

The social Web is characterised by individual participation and interaction in various spaces and emerging environments by sharing, registration in databases, be they bank-related, institutional or social networks, blogs, discussion forums, that allows the development of a digital identity on the web (Warburton, 2010). Social software, in an educational context, consists of making applications available, at the level of communication and interaction among individuals and/or group, by promoting the production of knowledge and its sharing with the community.

For some authors, among them Margaryan, Nicol, Littlejohn and Trinder (2008) and Warburton (2010), with the development of the Web and the importance given to the social Web, the existence of a network identity is a phenomenon impossible to avoid. The knowledge and the ability to search for, evaluate, create, share information and synthesise are increasingly important.

Thus, the characteristics of the Web 2.0, which motivate and facilitate the proliferation of tools that allow you to create, edit, simulate, comment, share text, sound, image and video, are tools that give value to the Personal Learning Environment (PLE) and to a learning network (Mota, 2009b), i.e., that enables a collaborative and open social learning through their Personal Learning Network (PLN). The PLN of each researcher allows them to have access to knowledge and experts 24 hours a day. Richardson (2013) proposes six steps to build a PLN and states that its value lies on commitment and maintenance of the interactions created. Of the six steps we stress: choosing a topic of interest that one would like to share; having a Twitter account – because this tool allows you to create great learning networks with experts; searching for blogs on topics of interest and follow them through RSS feeds; interacting with experts through direct tweets or through comments on their blogs; sharing only what is useful for your network; and finally, you should maintain regular sharing, comments or contributions, because only then your network will be able to expand. The PLN is intended for the researcher to learn and, thus, improve their practice, in a networked environment (Castaneda & Adell, 2013; Costa, Keegan & Attwell, 2009; Costa, 2010). It can be said, according to Costa (2011), that the PLNs are crucial to create interactions among individuals

through the use of Web 2.0 tools. The practice of nurturing a PLN online contributes to the emancipation of the self.

For Castañeda and Adell (2013), the PLN is integrated in the PLE, because with the technological and social advancement, the tools, processes and activities that enable one to share, reflect, discuss and rebuild with other knowledge, encourage and nourish this exchange and the acquisition of knowledge. The authors reiterate that the PLN is configured by the activity that each individual has and the tools that allow them to connect to others, through their publications, their shared experiences, or the direct relationship with their network. The PLN requires a range of skills related to their identity in online spaces where they are present and connected to. In this sense, while the individual builds, expands and manages their PLN, they must develop a greater and better awareness of their own personal and professional identity, because only with a strong identity can they strengthen the network that supports a large part of their learning. Personal networks are a set of relations through which people are part of social structures. Their configuration refers to the set of characteristics of the people that make up their personal network. In this sense, the PLN is informative about the social value of the researcher's network and the diversity of social spaces where they learn (Castañeda & Adell, 2013).

In short, the main elements that characterise the relationships developed between the members of the network are reciprocity and trust, which encourage the exchange of information with the aim of learning. The PLN describes habits of informal learning and creates opportunities for learning through relationships and interactions. They are not social networks, since the incentive to participate in them is in learning. They are referred to as the sum of social knowledge and connections that help people create their own environment for autonomous learning. Throughout their network, each individual serves the needs of personal learning, which is not limited by collective objectives.

Methodology

The research that has been developed in this field of study consists of quantitative and qualitative methods, depending on the research questions we want to address and the data that are sought (Morais & Neves, 2007). The models and tools that will be developed in this research as part of the methodology involve the combination of the two research paradigms (quantitative and qualitative) through a questionnaire survey, social network analysis (SNA) and a semi-structured interview.

The target audience of this study will be the researchers who are members of the community of the doctoral programme in Education, specialisation in Distance Education and eLearning at Portuguese Open University.

Initially, a questionnaire will be applied to the research community, in order to characterise their profile and define the features of their "Digital Identity", as well as to understand its importance and influence in networked learning, to describe their PLE and study how their PLN is created, maintained and nurtured.

A second phase will be carried out using a Social Network Analysis methodology, to obtain a representative group of each edition, in the number of three representatives per edition. This SNA will be performed based on the answers given by researchers to the questionnaire, specifically on the issues addressing the Web 2.0 tools used and the social networks where they have a predominant activity, delimiting a Digital Identity in this space with greater interaction with its members. After this selection, the social networks of the selected researchers will be analysed through a suitable SNA software, such as: Gephi, NodexL, “R”, Netlogo or others. This analysis will take place during a month, to enable the understanding of interactions, creation and promotion of the network. For this purpose, each researcher will be requested to collect a data file from the chosen social network, that will later be analysed in one of the abovementioned SNA programmes, in order to create a graph of the network and be able to read and understand it. To assist this reading and understanding of graphs on the networks of each researcher, a semi-structured interview will then be carried out. The interview will be made to the group of the nine selected researchers, with the objective of deepening some themes addressed in the questionnaire and the collection of data from their PLN. The collection of data from semi-structured interviews will be performed via Skype or Hangout, recorded and later made available in writing. Given the large volume of data that is expected, all stages of the present research will make use of devices and software tools for data analysis and treatment, both qualitative and quantitative, in accordance with their specific characteristics. Thus, we anticipate that data will be treated and analysed using SPSS (Statistical Package for Social Sciences), Nvivo and spreadsheets.

During the Social Network analysis, free tools will be used. There are several tools, each with unique features, and therefore it will be necessary to test each tool, bearing in mind the objectives of this research. The most appropriate software will be selected depending also on the social network to analyse, such as: NetDraw, Ucinet, Gephi, GUESS, NodeXL, NetLogo, “R”, among others.

Conclusion

Whether in the educational context in general, as well as in online distance education and in particular in the context of Open Universities internationally, there are no studies with the same objectives we propose for this research. There are also few studies that focus on the personal learning network (PLN), in the perception that from the network of contacts emerges a platform in which interaction and communication (conversations and dialogues) can occur, allowing non-formal learning.

Learning is usually associated to a formal context and institutional platforms, but in the digital age, where there is a strong participation in the web and researchers seek to connect among them and with experts in their field of interest, learning at an informal level can be promoted. Thus, the contribution of this study is to understand how researchers create, maintain and nurture their personal learning network (PLN), so that they can use it for the learning process (and research) as well as to understand how the PLN can promote the disclosure of the researcher’s digital identity.

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ICT INTEGRATION IN EDUCATION: THE GREEK AND SPAIN PERSPECTIVES AMIDST AN ECONOMIC CRISIS

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Abstract

Information and Communication Technology (ICT) and its applications are becoming increasingly prevalent in European education systems thus attracting the interest of the European Union and individual governments. However, due to various recent developments, including rapid and intensive changes in digital learning technologies, innovation, disruption, cloud computing, and mobile learning but also unclear policies, and economic constraints, some European countries lack effective pedagogical integration of ICT in education. As a result, it is difficult to clearly identify current educational policies and trends in these EU countries. This paper focuses on the use of ICT in the educational systems and practices in Greece and Spain, aiming to highlight not only the barriers imposed under the pressures of the current economic crisis in both countries, but also the key drivers that can lead to the reconstruction of the educational system.

Introduction

Information and communication technology (ICT) and its role as key enablers of innovation, creation and new opportunities are drawing more attention due to the economic constraint in the global level. As the benefits of ICT progressively materialize into real assets, and strengthening digital ecosystems becomes increasingly significant (Bilbao-Osorio et al., 2014).

“ICT in education” provides a variety of learning tools, authoring tools, editing tools, analytic tools, collaboration tools, scenarios and lesson plans that create opportunities for open and collaborative innovation practices, creativity and innovation in the classroom. These technologies and tools help the educational system empower individual teachers and learners to actively participate in the digital community and become creators of innovative processes (Balanskat et al., 2006; Abdullahi, 2014). On this front, most European countries have made significant progress over the years, but the level of progress is not the same for all countries.

The main aim of this research paper is to discuss the ICT integration in education in Greece and Spain. During the past around one decade, these two South-European countries have been seriously affected by the economic crisis. In both cases, education is primarily supported

by public funds and, therefore, the public cuts imposed by the crisis has impacted directly on the development, delivery and quality of education. Hence, although ICT-based education is a priority for both countries, it is questionable whether the investment required for ICT in education to develop in this direction may be realistically secured.

What follows is a summary of the main outcomes of research in the integration of ICT in European educational systems, carried out under the EU-funded Open Space Discovery project (2012-15), of which the authors of the present paper are members.

ODS is an open innovation and collaboration environment for K-12 teachers that facilitates educational content and tools for the creation, co-creation, use, re-use, sharing and retrieval based on OER as well as for networking and further collaboration among K-12 stakeholders (teachers, learners, parents, content and technology providers, and policy makers etc.).

The second and third sections present the project's study concerning school systems, key priorities, teacher education in ICT, monitoring and evaluation, in Greece and Spain respectively. The fourth section concludes with a discussion of the effects of the economic austerity on the future of ICT integration in education in these two countries.

ICT in Greece

Digital literacy is a high priority objective in the agenda of the European Commission. Greek educational policies have adopted the entire ICT literacy objective, set by the EU (Eurydice, 2011). Existing ICT policies in the Greek school system cover the following areas:

- Learning theories and teaching methodologies to promote digital literacy by introducing both access to digital learning material in classroom and at home (e.g. "Photodentro LOR" <http://photodentro.edu.gr/lor/?locale=en>) via web portals but also their use under pedagogical indicators in the classroom;
- Two levels of ICT Training for Primary and Secondary educators;
- Integration of e-portals, e-books and online resources in Primary and Secondary Education;
- Infrastructure and educational software for several special needs schools;
- Incentives to purchase notebooks for Secondary school 1st grade students ("Laptop for Students programme");
- Broadband in many schools through a school network (sch.gr), recognizing internet access as a basic right;
- ICT equipment in several schools that have the necessary infrastructure;
- Official policies to promote new learning environments under the vision of each political governmental scheme.

There are two main and imminent trends in education in Europe: i) the changing role of school teachers as a result of ICT influence, and ii) the impact of social media, such as Facebook and Twitter, which are already finding their way into classrooms (Johnson et al., 2014). According to a survey conducted by Korte and Husing (2006), many schools across the

EU countries already had internet access. In most countries the penetration rate falls just a little below of, or is at, 100%, in no country is under 90%, and the European average is 96%, although, the probability of school computers having internet access increases according to school level. The number of students in Greek schools without broadband is equal to the EU average (94%) in all educational grades but broadband speeds faster than 10Mbps is lower in Greece than the EU average (European Schoolnet, 2012). In Greece use of ICT by teachers is higher at all grades than the EU average (94.25%) (European Schoolnet, 2012).

In Greece, more than 23% of students choose to send emails to communicate daily, while 20% also browse the Internet during that time. Internet access and communication takes place through the official network “Hellenic School Net” (www.sch.gr), which also offers safety protection against spam, computer viruses, and other malware. However, there is largely a lack of expertise/ technical support to ensure e-safety, and the responsibility concerning, for example, reliability of information and other such issues falls mostly on the teachers. The technical support team of the Hellenic School Net is able to deal with some problems only when these occur in schools located in major city centres and their surrounding areas the situation. Consequently, in the majority of schools across the country most technical problems remain unresolved. The impact of the economic austerity is clear: insufficient existing infrastructure, very limited funds for its modernisation, as well as lack of investment in in-house technical support are insurmountable everyday problems for most schools.

According to report (OECD, 2001) a Greek primary school introduced ICT as part of an effort to improve students’ skills and competencies. The deputy principal stated that “ICT utilization led to collaborative work among students, which then led to the teachers changing their ways of teaching so that students now work more autonomously, collaboratively and actively”. Teachers did remark that “computer usage encouraged new ways of learning, that is, open learning approaches”, but also argued that “it was not the computer use per se that encouraged these new learning situations. It was the teacher who aimed for such approaches, facilitated through by the computer use.”

In 2000 in Greece more than 50 students aged 15 years old had to share one computer (Eurydice, 2004). Although in recent years this ratio has improved, the account above makes evident that too much relies on the responsibility and contribution of individual teachers, and thus there is clear need for a significant and systematic development.

Key challenges/priorities for education (general education priorities)

According to the OECD report (2011), the future wellbeing of Greek society depend on the improvement of educational schemes to boost skills and competencies of the country’s human resource capital by adopting more ICT developments in the existing educational curriculum. In Greece, the “Ministry of Culture, Education and Religious Affairs” <http://www.minedu.gov.gr/english-main.html>, is responsible for the educational and culture strategies and policy of the country. Education is compulsory by law for all children until the age of fifteen.

The challenges in a social and cultural context relate to many factors such as:

- Strong personal and family commitment to education, challenged however by the high costs of fees parents need to pay to support their children's learning especially in view of the university entry exams;
- The Greek Constitution's commitment to social equity and free, which, however, is not fully observed in all school environments (e.g. insufficient integration of children with special education needs);
- Several attempts to reform the education system, which are however politically motivated interests of the party or ministers that are in power thus resulting in unstable educational systems;
- Mistrust of governmental initiatives and serious concerns about corruption and misuse of public funds;
- Long tradition of highly centralised government and measures to ensure national cohesion and counter regionalism and corresponding lack of trust in private entities to serve public purposes in the education sector;
- Frustration and lack of teacher's motivation due to wage cuts, domination, assessment under controversial criteria, many of these being the direct or indirect effects of the current economic crisis.

Education reform/ current situation

In order to address the key challenges identified above, an education reform is needed as:

- Decentralisation of the decision-making process and strategy implementation, to overcome instability and achieve systematic longer-term goals according to needs of different regions and local communities. This would be a more inclusive and sustainable model able to meet the challenges of 21st century;
- Promotion of social, critical and reflective pedagogies, fostering collaborative and problem-solving learning;
- Integration of Information Communication Technology (ICT) and Open Educational Resources (OER) to education for all, flexible enough to address and accommodate different needs, teaching and learning approaches, and non-cognitive or emotional aspects of learning;
- Decentralisation of budget control so that more efficient spending and strategic investment in infrastructure may be achieved by the local municipalities.

Cornerstones of policy/financial constraints

In the State's Budget for 2012, the spending for the education was significantly reduced, the overall 16% reduction occurred during the period 2009-2011. These cuts represent not only a percentage of GDP (2.75% in funds allocated to education in 2012) but also of the regular budget (the lowest historical rate of 3.39% total costs when all previous was around 7-7.5% by 2009). In real terms, the budget for education in 2012 was €1.184 billion less than in year 2009. EU funding is also key in adding to the country's own resources: in 2000-06 EU provided €960 million matched by €420 million of Greek funding (Papazoglou, 2007). Further economic

austerity resulted in significant cuts in public funding spent on education: in 2009-2013 they reached 33% and an additional 14% cut will be implemented by 2016 with 5% cut already put in force in 2014. Greece is struggling to find the bailout money to avoid the default on its debts and bankruptcy which is one of the biggest uncertainties surrounding the global economy.

Teacher education for ICT

A teacher's qualification is obtained via 4-year long studies at a Pedagogy Department of the University (Eurydice, 2011). Further education programs for teachers include induction seminars/workshops for newly appointed teachers and periodic CPD seminars for teachers with more extensive teaching experience. These programs, previously organised by the Organization for further Education for Teachers (OEPEK), are now organised by the Institute of Educational Politics (IEP) (Eurydice, 2011).

With regard to ICT training in particular, there are two specially designed programmes offered by the "Computer Technology Institute and Press- Diophantus" <http://www.cti.gr/en/>: i) ICT basic skills (phase 1) and ii) professional face-to-face and blended training programmes for the development in ICT integration in school practice (phase 2). The project "In-service training of teachers in the utilisation and application of ICTs in the teaching practice" of the Operational Program "Education and Lifelong Learning", NSRF (2007-2013), which is implemented with co-funding from the EU and the ESF concerns the training of a large number of educators in Greek primary and secondary schools, in the in-class utilization of Information and Communication Technologies for the teaching process. Although these courses are not compulsory more than 50% or, in absolute terms, 80,500 teachers out of 145,000 have already been certified for phase 1 (European Schoolnet, 2010). However, a case study (OECD, 2001), concluded that although the training was sufficient to familiarise teachers with ICT technology, it did not convince or encourage them to implement ICT in their teaching.

Monitoring and evaluation – ICT skills' assessment

The European Commission asks countries to report on the assessment of ICT skills through theoretical and practical examinations or through project-based assessment. Greece uses only one form of a test at primary and secondary education. ICT teaching and evaluation in schools is delivered by, specialists in the field of "Computing" (Eurydice, 2011) but not by already trained teachers (from CTI- Diophantus) and teacher-specialists in the field of "ICT in Education" (Med, Dr). Not granting teaching approval for the "ICT in Education" to specialized teachers in the Greek education system is very problematic.

In Greece, private certificates for the assessment of the ICT skills are issued from the Institute of Educational Politics (IEP) and the Computer Technology Institute & Press Diophantus (CTI) (Eurydice, 2011). A combined evaluation schema of an automatic evaluation system (through a questionnaire via a e-platform) and a "free text" test (creation of an ICT Educational Scenario) is used for the evaluation of the trained teachers in "ICT in Education".

The Open Discovery Space (ODS) is also providing a self-assessment mechanism to some of the Greek schools to measure the impact.

ICT in Spain

Since 2005, there have been several types of action programmes for the integration of technology in schools across all regions of Spain. Each Autonomous Community government is fully responsible for the educational policy in its region. The Spanish approach is based on a de-centralized model, rather than implementing a comprehensive nation-wide plan to implement new technologies in the Spanish educational system as a whole. Nevertheless, the Institute of Educational Technology of the Spanish Ministry of Education is responsible for the integration of ICT in non-university educational stages, coordinating these various programmes. It also maintains some initiatives at a national level in collaboration with Communities such as:

- “Proyecto Agrega” (Agrega, 2015): The building of a national repository for digital resources that integrates learning objects described using a Spanish application profile of the IEEE Learning Object Metadata standard, which has become a national norm;
- “Escuela 2.0” (Escuela 2.0, 2015): A nationwide ICT plan for schools launched in 2009, that integrates the developments already achieved in each region. The plan aims at generalizing access to hardware and digital content. All fifth-grade students are provided with a notebook, and their classrooms with IWB and wireless connections, while teacher training is implemented according to teachers’ level of competence.

In the specific case of the Autonomous Community of Galicia, Proyecto Abalar (Abalar, 2015) deploys the strategy for the full integration of ICT in educational practice of Galicia, as one of the areas of intervention of the Galician Department of Education. Abalar includes and integrates all initiatives in education, joining efforts for the modernization and improvement of education as part of the strategy of the Galician government for the promotion of ICT in all sectors of activity.

Abalar collects, integrates and enhances through the espacio Abalar portal (Abalar, 2015) provide a comprehensive resources in response to the challenges of children education in the digital society.

Since academic year 2010/11 all schools in Spain have Internet access (99.8%), 92.0% with broadband connections (above 512 Kbps). 73.8% of schools have wireless (Wi-Fi) access, 51.5% in Galicia. In 2010/2011, the number of pupils per computer for teaching and learning was 3.5, 3.8 in Galicia.

About 70% of schools have a person responsible for coordinating ICT technical functions, teaching and, providing support services for students. Policies on the integration of ICT in the different regions vary in terms of emphasis and depth. Research in recent years has focused on analysing the impact of different policies had in different regions.

For example, in Galicia, research undertaken during 2004 concluded that ICT is used mostly for administration and management rather than for teaching, but since then a tremendous effort has been undertaken to introduce ICT in the teaching and learning process in primary and secondary education. Indeed, the Abalar project mentioned above aims at a qualitative and quantitative development of the Galician educational model, in order to improve the efficiency of the teaching and learning process through the integration of ICT in all education

Thus, the Abalar project strategy revolves around the concept of digital school. The digital school goes beyond the concept of traditional school, and tackles both human and educational resources as well as the infrastructure and services required for the daily use of technology by all actors in the educational community, in teaching, learning and administration.

Cornerstones of policy

Technological advances have historically shaped and presently shape education. To get in sync with the habits and experiences of the new generations requires a thorough review of the classroom and educational space concepts, which is only possible within a holistic approach to the educational role of new technologies. The widespread incorporation of ICT in the educational system will personalize education and adapt it to the needs and pace of each student. On the one hand, they serve as reinforcement and support in cases of poor performance and, on the other, they will support the spreading of knowledge taught in the classroom without limitations. Motivated students can thus gain access to educational resources provided by many Spanish and international institutions according to their abilities. Furthermore, the responsible use of new learning technologies by students must be guided throughout the system. ICTs are also a key tool in teacher education and learning throughout life, enabling citizens to combine training with personal or work obligations

The Spanish Ministry of Education has established a minimum curriculum for every school which takes up 65% of the total curriculum time. In primary and secondary education, ICT is considered as a transversal competence and is covered in all subject areas in the curriculum. ICT as a subject is first encountered at the secondary school level. There, students can study ICT each year from 7th to 10th grade. ICT targets can be divided in those that are subject-related and the more generic ones, which coincide with the digital competence of the European key competences framework.

These digital competencies show how ICT can be used to serve two functions; namely, i) to transmit and to generate information and knowledge and ii) to identify and resolve problems on software and hardware while critically analysing the information obtained through collaborative work. The national curriculum is organized in subjects, with specific contents, goals, assessment criteria and their contribution to the European Key Competences Framework. ICT competence is expressed in greater detail in the assessment criteria. For example, in Natural Sciences in secondary school the following capacities are assessed: “the capacity of acquiring meaningful information from different sources, including information and communication technologies, and the ability to state conjectures about both naturally occurring as well as induced phenomena, in experiments or experiences, where the

consistency of the reasoning process should be valued over getting *the answer right*. *Special attention must be paid to the oral and written expression of the results, whether on paper or in digital format, which must be illustrated with images, tables, graphs, diagrams, summaries, etc.*” Another example is Mathematics in which “the capacity of applying percentages and rates in order to solve everyday problems, as well as financial problems, where the ability of using a spreadsheet should be valued as a function of the quantity and complexity of the numbers used is assessed. This criterion is used to verify the capacity to apply percentages, rates, and percent increases and decreases to problems related with frequent financial situations and to value the capacity of using information technologies to carry out the operations when necessary”.

In Galicia, these goals go beyond the established national objectives to also address an overall promotion of the digital culture through the adoption and cultural integration of ICT in all aspects of the educational process. With respect to teachers, this is being achieved by designing a specific training plan for enabling the use of ICT in teaching, and providing digital educational resources for use in different subjects across the curricula. With respect to families, it is being addressed by spreading the new online communication channels and audio-visual media.

The whole process is designed to drive the change from a traditional school’s model to a new digital education model, promoting the transition from the computer room to the computerized classroom; from textbooks to e-books; from passive learning to collaborative learning, research-based learning, and active and interactive learning; and from teachers teaching informatics to teachers using informatics to teach.

Thus, the established goal is that all students, to complete their training, must have digital competence.

Teacher education for ICT

ICT is compulsory in initial teacher education. Primary teachers must take at least a one-semester subject covering ICT in Education. Secondary school teachers must take a certification course, part of which covers the integration of ICT in the teaching of their subject of expertise. Initial teacher training tends to be a mixture of a theoretical and a hands-on approach that tries to enable future teachers to use ICT in their classrooms as well as to reflect upon and investigate them. Initial teacher training follows the universities’ own methodologies, which usually includes a several months mentoring period with an in-service teacher.

ICT training for an in-service teacher is not compulsory. Nevertheless, there are some teachers’ training initiatives at Autonomous Community level related to the implementation of the Escuela 2.0 plan. Teachers sign up for those courses offered by educational authorities (online or in person), according to their preferences and/or needs. In the case of Galicia, the Abalar project includes actions and content for in-service teacher training on ICT.

In addition to the formal online courses where teachers get certifications for their participation, one of the social networks (internetaula.ning.com) of teachers that the Ministry supports is organizes learning workshops in which an expert designs a short 'course' which includes a set of activities on a certain topic. The methodology tries to encourage peer-to-peer learning and registration is required (from 200 to 500 teachers register). They last only for a couple of weeks and no certification is provided. It also includes webinars in which an expert answers in a chat session questions from teachers (around 50) that register for the event. The subjects are chosen by the members and by groups with a common interest within the network in cooperation with ministry staff. Subjects are mostly focused on the use of ICT, particularly the presence of web 2.0 in school; they sometimes address the use of a particular tool (i.e. podcast in education, social networks in education, etc.).

In-service training courses are mainly taught by expert teachers and occasionally by university lecturers. Initial training at universities is taught by lecturers in this area of expertise whose academic interests include the role of ICT in education.

Policy alignment and consistency

We may next try to outline how these policies align with other national priorities and policies, extending beyond education, to the economic, social, and media spheres:

The profound changes that the Spanish society faces today require a continuous and reflective alignment of the educational system to the emerging demands.

The introduction of new Information and Communication technologies provides for the first time in history to implement a really personalized and universal educational system. Never before education had such an opportunity to be a key factor of equity and social welfare. The educational system should take special care of those who drop out before they have the acquired knowledge and skills required by international quality standards, because those abandoning education in such disadvantageous conditions at the beginning of their professional life are doomed to unemployment or to jobs of limited value. These circumstances, in a more and more global economy that demands ICT trained workers and entrepreneurs, become a scourge that limits the possibilities for social mobility, and even leads to the generation of poverty.

Monitoring and evaluation

There are periodic national and regional surveys that estimate how many teachers use ICTs and what they use them for (European Schoolnet 2012; 2013). All schools entering pilot plans are closely monitored and they have detailed evaluation plans (European Schoolnet, 2012; 2013).

The trend that has been widely identified during the past years is that online courses are gaining popularity among teachers. Online courses usually achieve the highest levels of satisfaction among participants (European Schoolnet, 2012; 2013).

There is no nationwide specific accreditation scheme for ICT teacher competence such as ECDL. Teachers are certified on a course-by-course basis, according to the credits (number of hours) devoted to them. Courses need to be certified by the regional authorities to be taken into account in the teachers' professional records and they are mainly taken outside school time and online. A teacher is required to take a minimum of number of hours (around 100) every six years in order to obtain a raise in her salary, but the courses do not have to be about ICT. Nevertheless, the provision of ICT courses (especially online), tends to outnumber non-ICT related courses.

Comparison between the perspectives of Greece and Spain

In both Greece and Spain, there have been several initiatives with different types of action programmes for the integration of ICT in Education. Educational Institutes in both countries are responsible for the integration in ICT in Education (e.g. CTI & Press- Diophantus in Greece and Educational Technology Institute in Spain). One main difference between the two countries however, is that while in Spain different policies are followed in each of the reasons that respond to their specific educational needs and provisions, thus allowing continuity and development to be built on previous achievements (as illustrated by Galicia's case); in Greece, the same centralized policy applies to all regions.

Both Spain and Greece have constructed national repositories for OER, for example, "Proyecto Agrega" and "Photodendro", respectively, and have run pilot tests for the promotion of notebooks to students in specific grades (first-grade in Greece, fifth-grade in Spain). They operate under comparable "digital school" strategies, aiming at the full integration of OER and day-to-day use of technology in teaching, learning and administration by all members of the educational community.

In principle, all schools in Greece and Spain have internet access, but while In Spain about 70% of schools have a technical personnel responsible for coordinating ICT technical functions and dealing with related problems, this is not the case in Greece, where for the most part such responsibilities fall under the teacher. However, educational reform it is needed in both countries with regard to the content and the methods of the integration of ICT in Education able to meet the relevant challenges an education reform is needed (e.g. sustainability, the need for the adoption of critical- reflective perspectives, ICT and OER integration, financial allowances etc.). Such reform however, is seriously undermined by the significant reduction of public funds observed in recent years.

With regard to training, both in Spain and Greece teachers are trained at higher education level, during their undergraduate studies and further in- school programs that are organized as part of CPD. Most teachers receive face-to-face training, while others are trained through e-learning, and thus a less blended training process (e.g. 2nd Level "Blended Model" from CTI-Diophantus in Greece).

Computer-based assessment is not often used as it tends to be limited to “tests” that are not considered sufficient. Both European countries are fully conscious of the technological advances of a competitive education within the contemporary globalized world. A major challenge of the educational reform is the support and development of non-cognitive skills, critical reflection, and creativity through the implementation of ICT.

However, both Spain and Greece need to address problems of inclusivity and overcome the divide, much accentuated by the dire economic conditions evidenced in both countries, between privileged and challenged members of their respective population, in respect to access to ICT and education more generally.

Discussion and conclusions

This paper makes the contribution to the understanding of the characteristics and strategies currently holding in Greece. In Greece, political turmoil and economic uncertainty have led to conditions and policies in education that are unstable. Therefore, this paper provides some valuable insight into the main drivers, funding mechanisms and actors that can influence the future development of ICT in Education. The existing policies aiming at the integration of ICT in all schools education, as well as the existing ICT training programs for proper pedagogical use of ICT tools through OER and learning scenarios, characterise a society that is strongly interesting in being an equally member of the EU community in this respect. There is certainly a lot of room for further changes, development, and improvement with great willingness from the educators, school leaders and agents for change to be trained on how to utilize ICT in education through ways that can make their teaching more interesting, creative and relevant to the real problems that the society faces. However, although the intention, willingness and policies are there, the schemes cannot be fully implemented due to the economic austerity and the challenges which presents both at an individual as well as at national level. Political stability as well as decentralisation of the decision-making process is essential in order to ensure national cohesion and sustainability in the long-term. ICT in the context of critical and constructivist Education is a key to the development of a society and economy that are in crisis. Additionally, the controlled involvement of the private sector in education, according to pedagogical criteria of quality of the provision and its value for the society, would be added value in a strongly competitive and rapidly-changing global environment.

In the case of Spain, ICT infrastructure is well deployed across the country, perhaps due to the country’s decentralised educational system. Regional communities have been able to approach ICT from both the perspectives of integration in the curriculum and of hardware infrastructure. The main drawback in Spain is how these technical infrastructures are being implemented in the daily activities in schools. Most of the investment in ICT for education have been carried out before 2008. The effect of the budget restrictions was very clear also in this area. Further investments would have been required to cover: i) Appropriate teacher training covering the whole teaching population; ii) Tools and services exploiting the underlying hardware infrastructure and iii) Adaptation of the whole curricula to benefit from

the ICT potential in education. This should have included the design of proper learning activities at a higher level that could be adapted to the school level context. Unfortunately, the ICT integration in schools in Spain is in a stand-by state. Only 10% of staff retiring is replaced, which means that the teaching population is getting older and low motivated due to the increase in tasks and the reduction on salaries. The required investment in tools and services is not possible due to the budget cuts. Only those, still existing, highly motivated teachers, design their own learning activities making use of ICT tools. In many cases, these teachers use their personal developed spaces rather than those that could be provided by the Ministries.

Sadly, we do not foresee a promising future in the short term in these two countries. Even if the economic situation changes in the future, it would still be the case that the pre-crisis deployed infrastructures would then be obsolete and as, in the past, investment was geared towards hardware rather than service/training, Greece and Spain, will be facing serious difficulties in the foreseeable future. It is thus of paramount importance and urgency, as we hope this paper has shown, that significant changes be made to policy mechanisms, distribution of budget, and investment focusing on teachers/users training and how they could use ICT in order to promote innovative, creative and constructive education with the necessary skills to secure a stable position in the 21st century across Europe and globally.

Open Discovery Space (ODS) fits in with the Open Educational Resources (OERs) movement that aims to create and share educational resources that are freely available online for everyone at a global level. The ODS succeeded to extend the reach of OERs, learning, training and assessment tools opportunities to Greece and Spain. However, it is also important that these two countries need to get more benefit from the EU initiative and approaches such as Open Discovery Space (ODS) project and ensure the alignment, adapting and integration of innovative ICT model and training mechanism as part of the national education policy and system.

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Acknowledgement

The part of this work is supported by Open Discovery Space (ODS). The ODS addresses the challenge of modernising school education by engaging teachers, students, parents and policymakers in a first of its kind effort to create a pan-European e-learning environment to promote more flexible and creative ways of learning by improving the way educational content is produced, accessed, and used. The full title of this project, funded by the European Commission's CIP-ICT-PSP-2011-5 programme, Theme 2: Digital Content, Objective 2.4: e-learning Objective 2.4, is "Open Discovery Space: A socially-powered and multilingual open learning infrastructure to boost the adoption of e-learning resources". The project started in April 2012, engages more than 50 partners all over Europe, and lasts for 42 months.



FROM DISTANCE LEARNING TO OPEN EDUCATION: A CHANGING LANDSCAPE

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My intention is that this paper leads to consideration of difficult questions. It does not attempt at this stage to give answers. It should also be said that the questions derive from an analysis from the European region, which can be of course be contested. The analysis is based on the proposition that there is a significant change taking place in the landscape of technology enhanced education, flexibility and access, where the mantle of innovation is now passing from the world of open, distance and e-learning (ODEL), to a much more distributed range of actors, including many on campuses who do not use the language of ODEL at all. This matters to professional associations in the field of distance and e-learning such as EDEN because their sphere of interest is defined, as the organisational title suggests, by ODEL. If issues of technology enhanced learning, flexibility and access – the principle defining characteristics of organisations that choose that identity – move elsewhere this poses significant strategic issues for ODEL associations for the future. We may find that the new landscape will grow different kinds of professional associations, seemingly more relevant and attractive. Indeed there is evidence that this has already begun from the mid 1990's to take place, and that the pace of change is now accelerating. Hence the need for discussion now.

I would like to begin by looking at the landscape in Europe, the world region I know best, starting from the 1970's and 1980's. In this period the lead organisations in the field of flexible technology enhanced learning that provide access at scale for new categories of learners were the single mode distance teaching or open universities, of whom there were 5, in Portugal, Spain, Netherlands, Germany and the UK, being joined later by the open universities of Greece, Catalonia and Cyprus. These universities organised from 1987 a network, the European Association of Distance Teaching Universities (EADTU) that acted as an influential voice effectively to assert that the distance teaching universities represented the paradigms of innovation in technology enhanced teaching, lifelong learning and access. Initially and for a significant period thereafter only one distance teaching university per country was allowed membership, and although this has more recently been relaxed somewhat the core membership remains single-mode distance teaching universities, an increasingly small proportion of the ODEL actors in Europe. Nonetheless EADTU's view of the ODEL landscape continues largely unchanged until today, with the EADTU website currently claiming that

EADTU is Europe's leading institutional association for open and distance higher Education, and is at the heart of the modernisation agenda of European universities.

www.eadtu.eu/about-eadtu/mission-strategy.

Both phrases in this sentence suggest a pre-eminence of role in the field of post-secondary ODEL in Europe that seemed contestable even in the 1990's. At the heart of this discussion is the view that this perspective is even harder to maintain now.

EDEN, the European Distance and E-Learning Network, was founded in 1991, and took a different approach to professional identity, deriving from a different understanding of the landscape of ODEL. The most important difference was to admit all educational institutions who had some part of their provision in distance mode (the dual mode or blended institutions) or those who expressed an interest in distance and e-learning, recognising that innovation in flexible and open learning was already, and was going in the future to be distributed across a wide range of organisations, and not monopolised by the open universities, important though their places in the landscape were. EDEN's purpose is expressed more modestly and realistically as

To share knowledge and improve understanding amongst professionals in distance and e-learning and to promote policy and practice across the whole of Europe and beyond.

www.eden-online.org/introducing-eden.html

EDEN's activities are present through its conferences twice per year which in total attract some 600-700 participants, and its journal EURODL, together with a wide range of projects in which it primarily supports member institutions. The identity of EDEN is clearly and singularly based on distance and e-learning, and I want to suggest that this too is now a strategically vulnerable position, as the field of innovation in the use of technologies for flexible learning and access has grown so much more diverse to include many people and institutions who focus their activities now on campus without the concepts, vocabulary, or identity of ODEL.

The reason for saying this is that many, in the UK at least the majority of campus-based institutions now use learning management systems on which they place learning resources, to include both course based study and more general study support modules; students communicate with their lecturers and tutors by email; students learn using the LMS with laptops and tablets with Wi-Fi in their homes, in cafes, on trains etc., in other words off campus. The sharp distinction between ODEL practice and that which the ODEL world used to term, somewhat disparagingly 'conventional' education is thus diminishing, as the digital revolution accelerates its transformation through the campuses. This is not to say that the lecture, so regularly held up as an object of derision as a method of teaching in the rhetoric of ODEL, has completely disappeared. But conventional campus-based education of the 1990's is no longer what it was. Technology enhanced education (TEL) is very active on campus, and

indeed as I hope to demonstrate below, has seized a considerable part of the agenda for innovation.

The open education movement is led, though not exclusively, by two main strands, those of Open Educational Resources (OER's) and those of Massive Open Online Courses (MOOCs). OER's have led discussion about the need to reduce or remove the cost of text books, and to extend access by creating cheaper courses, as well as driving an anti-commoditisation rhetoric which seeks to change the structure of cost in learning resources and to defend the notion of education as a public good. It has been an important contributor to rhetoric such as 'content is now free', that drives pedagogic innovation on as well as off campus. These seminal developments of the last 10 years or so have been rooted in exploration of the power of digital resources, conceived primarily within frameworks of TEL, not ODEL. Leadership for OER's originally came, as with MOOCs, not from ODEL institutions but from research-led universities such as MIT. While there might be concerns about the extent to which OER's are delivering on their promise – many repositories have been created but use and adaption lags significantly even after a decade – there is no doubt that the open education movement has captured the mantle for innovation for technology and the discourse for inclusion. The story is the same with MOOCs, with initial scepticism on the part of some leading ODEL figures, which clearly resented the step by new entrants from outside ODEL into the digital learning field without paying their respects to those who felt they had occupied it, and indeed led it. While it is true that some (but not all) MOOCs were pedestrian or worse in their pedagogy, MOOCs captured the imagination of politicians, funding and philanthropic agencies, as well as venture capitalists, not to speak of millions of learners, in ways that open universities may have felt was their prerogative. It is also true to say now that open universities have fought their way back into the field, above all with the Future Learn MOOC platform built by the Open University, where the large majority of MOOCs are however provided by research-led campus universities. More recently we have begun to see MOOCs being used as short courses within on-campus programmes, further eroding the position of ODEL as a distinct and separate field of practice.

This is evidenced at the level of new and increasingly rival professional associations in the European context. The Association for Learning Technology (ALT) was founded in 1993 in the UK, and runs a journal, conferences and a professional certification programme. It sets out as its purpose:

to ensure that use of learning technology is effective and efficient, informed by research and practice, and grounded in an understanding of the underlying technologies, their capabilities and the situations into which they are placed.
www.alt.ac.uk

If we review the 2014 Volume of the Research in Learning Technology Journal managed by ALT, of the 21 articles, only 3 explicitly mention online learning. The remainder relate to TEL innovation on campus, or do not specify if on-or off- campus. The Editorial by O'Reilly surveying the 2014 volume refers to OER's and open badges, but not to ODEL. It can be

suggested that ALT's view of the world sees ODEL as a feature in the TEL landscape but not the landscape itself, and that this is becoming an increasingly plausible understanding.

This is true too for another significant and energetic competitor, Online Educa Berlin, founded in 1995. Online Educa Berlin is an organisation that exists primarily for its annual conference, which in 2014 attracted 2400 participants and some 70 trade stalls promoting products and services, a far larger event than those driven by the narrower agendas of ODEL. Its purpose is expressed thus:

ONLINE EDUCA BERLIN is the event for learning professionals to discover innovative solutions, absorb new thinking and take action by implementing changes in the field of learning and technology.

Once again we have no explicit reference to ODEL. Where ODEL is mentioned in the 2014 Conference programme it is in dual-mode or blended contexts. Open Universities are marginal to this landscape. There is as much if not more focus on TEL solutions on campus.

So if we look at the terminology of the last 20 years we can recall at least the following:

- Open Learning;
- ODL: Open and Distance Learning;
- E-learning;
- ODEL: Open, Distance and E-Learning;
- Web-based learning;
- Online learning;
- Mobile learning;
- Flexible learning;
- Distributed learning.

Some of these terms are difficult to distinguish from others; some have not stood the test of time; and some current terms risk extinction. For example, the advent of tablet computers and Wi-Fi may, according to a recent UNESCO report, may make the term 'mobile learning' redundant:

gradually even the term 'mobile learning' will fall into disuse as it is increasingly associated with learning in a more holistic rather than a more specialized or peripheral sense
(UNESCO, 2013, p.71)

The UNESCO report is suggesting that once technology becomes naturalised in a landscape it loses the specific attention it had in the phase of innovation. I am suggesting that something of this sort is happening with ODEL also. It is noteworthy that post-2000, as the digital revolution has fast made its impact in educational contexts, the newer terminology of TEL and Open Education has been qualitatively different. It is not a variant of what has gone before, where central to the definitions in most instances has been the mediation by

technology of distance between teacher and learner, distinctive to distance education. The newer terms and activities that support them take digital technology for granted, as it has been normalised and needs no explicit identification. People learn anywhere, whether in off or on-campus systems. This creates the question as to where this leaves distance education as a separate field of practice in the future?

So the core question for the professional associations based on ODEL is whether the identity of ODEL will remain compelling and engaging, and for how long, or whether the new landscape I have set out threatens it in such a way that we have to adapt and seek to create a new identity. In summary, I would suggest not that ODEL professional associations are threatened immediately, as the combination of brand and the current landscape of mixed understandings is such that I believe there is a 3 year window for reflection and change. It may also be that the European and North American regions where this analysis is most advanced, in my view, is not representative.

In summary I believe the likely outcomes for ODEL professional associations would be:

1. Continue substantially as they are, as contrary to the proposition expressed here the threat is judged to be fact low;
2. Adapt the organisational identity to the new landscape of TEL and the still important issues, globally of widening access and inclusion;
3. Accept that the job of promoting and supporting ODEL will be completed at some time in the mid-term, and that the organisation's role may come to a natural end.

My own view is that 2 above is both necessary and possible, and that a network such as EDEN stands in a strong position to lead the necessary revised understanding of the new landscape. EDEN's history, strong and developing brand, and significant links with a range of institutions internationally, give confidence that IT can avoid the third option. However, going on for the next decade without adapting to the new landscape will I think make EDEN and other ODEL focused organisations vulnerable to rather than strengthened by environmental change

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BOLDIC – OPEN LEARNING RESOURCES ONLINE

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Background

The general purpose of the “Boldic – open learning resources online” network is to deepen and bring further the co-operation between Nordic and Baltic organizations dealing with distance education, flexible learning and e-learning by opening the community for new partners from both the Baltic and the Nordic countries. The network has been supported by Nordplus (Founded by The Nordic Council of Ministers) for ten years and we want to disseminate results, discussions and future issues during the EDEN Conference in Barcelona 2015. There is a continuous increase in the demand for technology supported learning material, and especially so for material developed for on-line learning. Most of this material is developed in such a way that it normally is quite easy to change language and in other ways fit the material for use in different countries. I.e. the field is very well set up for exchange of material and for continuous cooperation in development, marketing, etc. In short, we have a demand, what we need is better marketing and simpler exposure of the material between the potential exchangers of the materials. The intention of the network is to establish a major Nordic and Baltic integration project supporting open learning resources online. Apart from better quality in learning, the project proves the benefits possible by simple cooperation between the learning organizations of the different countries. The Boldic network also works for supporting cultural exchanges as the materials often contain cultural parts. (Kågström, 2003, p.25).

Description of the Boldic work

We have described and presented some nominated projects and winners of Boldic Award during the last ten years. Also given examples and showcased progress work done during Boldic project in the field networking in flexible learning, distance education and e-learning. Interesting issues for improvement for better ODL innovative projects will be showcased.

The Boldic Award work seeks to recognize outstanding organisations and people in the open and distance learning field. The Boldic Award winners should support any ODL-activity connected to adult learning meeting one or more of the following criteria: teaching/learning arrangements, support systems (for delivery of learning content or/and learning support), development of activities, content or understanding within the ODL area and the activities should be transferable to other countries and be learner focused, facilitate blended or flexible

learning, be innovative, be scalable, have a sustainable strategy, have a sensible and appropriate approach to technology and involve continuing evaluation. Both persons, projects and organisations can be nominated for the Boldic Award. (Sandström, 2010, p.1)

Previous Boldic Award winners

2005 – Network Upper Secondary School in Jämtland, Sweden

“They have been pioneers and innovators of adult education at a distance, through a flexible combination of distance and campus studies.”

Network Upper Secondary School in Jämtland was nominated as Swedish candidate for the following reasons. They have been pioneers and innovators of adult education at a distance, through a flexible combination of distance and campus studies. They have in a good way combined distance learning for adults and pupils in schools. They have found effective ways of operating learning centres in rural areas.

Course square has paved the way for fruitful collaboration on learning resources, both regionally and nationally. The province developed early its own First Class conference support system. This now has a coverage that is higher than any other example in Sweden. This is unique and made more efficient by new linked tools such as online evaluation, short video clips or entire web based courses etc. This advanced First Class system is the technical infrastructure on which the network of study centres in the region is built. Though the study centres are not part of the original NVG project it facilitates easy to use technical help with updated advanced tools suitable for e-learning use, demanded by users who can formulate their needs.

2006 – Nettskolen NKI, Norway

“For promoting a learning concept that adds an innovative new dimension to student aid in flexible distance learning.”

Promotes and develops the Nordic tradition in ODL. The Learning partner concept adds a new, innovative dimension of student support to the flexible distance education.

NKI Nettstudier offers flexible online education within a wide range of disciplines in partnership with recognized colleges and universities. NKI's courses are available 24/7, 365 days a year; so that you can start whenever you want, from anywhere you are, with the help of teachers, study counsellors, and learning partners. Last year, NKI registered approximately 10,000 students. NKI students can choose from a pool of over 300 individual courses and studies. Courses range from IT and communication to business administration, economics and finance, health and social care, and languages which are taught at secondary, college and university level. NKI's administration is made up of more than 40 employees and approximately 150 teachers. Most studies are offered to Norwegian-speaking students, though we are developing coursework in English in partnership with prime Colleges and Universities abroad, such as Berghs School of Communication in Sweden and Danish School of Media and

Journalism in Denmark. NKI courses are mainly in Norwegian, but they are also assessing options for eventually being able to offer studies and courses in Danish, Swedish and English.

2007 – Vitus Bering, Denmark

Vitus Bering in Denmark has developed the e-learning course “Energy-efficient driving for buses and trucks” using mobile technology for drivers. Via mobile phone and iPods the drivers get the video sequences and text and sounds as digital learning resources. Truck and bus drivers in Denmark can learn how to save the energy while they are in the vehicle. The course is very flexible: the drivers have access to the course anywhere in the world. The drivers can practice what they have learned when they get behind the wheel again. The evaluation is ongoing and the student can see how much energy they have saved when the course is completed. The project manager for the course has supported concrete learning outcomes as measured by the fuel consumption on the vehicle. Some drivers have a 10-15 percent saving of fuel after they have done the course. The course is translated and will become offered for German-speaking drivers.

2008 – MKFC Stockholm College, Sweden

*“A full commitment in e-learning and activities around internationalization.
A popular education in a globalized world, supported by e-learning and
modern learning management systems through the Web.”*

The reason MKFC was nominated and won the Boldic Award 2008 is that MKFC has shown these key elements: The approach they use is expected to be transferable to the whole Boldic region. It has been a student governance within the competence development. They seem, and allow for flexible learning and they work innovatively and the approach is scalable and has a sustainable strategy. MKFC supports the work to develop a methodology to exchange experience in ODL (Open Distance Learning), creating an infrastructure for network and exchange experiences on “best practice” in ODL education.

2009 – Bergen University Netspank, Norway

“Nettspank is a 100% online course covering the first year of Spanish language and Latin-American studies at bachelor level. Its innovative use of platforms allows of synchronic communication (audio and chat) in combination with PowerPoint presentations. Students are able to follow the online classes from everywhere in the world.”

Online Spanish is 100% online, without attendance. The program recently received a Boldic Award for creative solutions. The project leader from Bergen University Department of Foreign languages received the Boldic Award at a ceremony in Stockholm. This is the result of a social need and academic entrepreneurship at the Department of Foreign Languages, at the University of Bergen. In recent years, Spanish is becoming more and more popular in Norway. From its inception the Spanish course produced 26,000 credits, equivalent to 60 full-time students annually. The figures show that Web Spanish is a middle sized subject at the Faculty of Humanities. The Internet program is located on a so-called 100-level equivalent,

the ancient discipline. In addition, there is also an online introductory course in Spanish at the Department of foreign languages, leading up to the Web Spanish study. Bergen University are happy for BA2009 and it brings also international recognition. There are many people involved in the project and they have worked hard developing the online Spanish course. Both those who have supplied electronics and teachers how many have worked part-time, deserve a big thank you for the good work done in online Spanish.

2010 – Aarhus University ASBCAST video repository, Denmark

“The assessment committee stressed that ASB Media has demonstrated creativity and innovation by combining video presentations with research material.”

ASBCAST is the media archive at Aarhus School of Business, Aarhus University (ASB). ASBCAST provides the framework for all media productions in research communication and teaching at ASB. The content is primarily research stories, mini-lectures and recordings of events. Research stories present the core of the researchers' fields. They focus on issues that are topical and relevant to business and society. The form is short and direct, and they introduce new stories every week in association with ASB's own 315 researchers and a variety of visiting international researchers. The platform is a modification of EduMedia – a video service of the Danish Research Network. All material is provided with keywords (Meta tags) and placed in a structure that makes it easy to find relevant topics within the ASB's research areas: Business Law, Marketing and Statistics, Business, Management, Economics, Language and Business Communication. ASBCAST works on all platforms and in the most common browsers on PC and Mac. The video player is Flash-based.

2011 – NKI, Norway, Berghs school of communication, Sweden and Danish School of Media Multimediamjournalistikk, Denmark

“This is a unique collaboration project where Swedish, Danish and Norwegian students participate in blended learning online multimedia journalist courses.”

The criterion is that the award-winning ODL activity can be used in the Nordic and Baltic countries, be learning centred, supporting flexible education, be innovative, durable and easy to use, and promote continued development in the area. Multimedia Journalism is an education in journalism focused on web and online media. All courses in the program will be implemented as online courses and passed the exam for a total of 30 credits from UPDATE Danish Media and Journalism College. The program was developed with support from Norway University and is a Scandinavian cooperation among UPDATE Danish Media and Journalism College, CSI Nettstudier in Norway and Berghs School of Communication. As project manager for this is Morten Flate-Paulsen and he said: “We are happy receiving Boldic Award for our Scandinavian nettstudium in multimediejournalistikk. This is a unique cooperation between Swedish, Danish and Norwegian students who participate in a blended learning environment on the web. The students can start and chose the tempo that match them. Focus is on text, layout and video production for multimedia journalism.

2013 – RIGA Technical University, Latvia

“For the innovative project work done with integration between broadcasting TV, internet based computers and mobile phones for training and courses during the Ebig3 project.”

This project will allow a learner to use a single delivery channel at a particular time (depending on availability and preferences) or a complementary combination of two or three delivery channels thus supporting learning anywhere anytime paradigm. The work on the project solution includes integration of technical issues for cross-media learning content delivery, refinement of pedagogic considerations, development of shared understanding of target user learning contexts in border areas, production of learning content & organizing course pilots. The sample courses on the new system will be related to entrepreneurship or ICTs. Project consortium will develop 10 innovative cross-platform courses in Latvian and Lithuanian. This project will allow not only use traditional internet based systems but uses TV technologies and accessibility mobile technology. The system will combine a wide coverage of TV technology and a wide accessibility of mobile technology with the capacity and flexibility of broadband. This will allow a learner to use a single delivery channel at a particular time (depending on availability and preferences) or a complementary combination of two or three delivery channels thus supporting learning anywhere anytime paradigm. The work on the project solution includes integration of technical issues for cross-media learning content delivery, refinement of pedagogic considerations, development of shared understanding of target user learning contexts in border areas, production of learning content & organizing course pilots. The sample courses on new system will be related to entrepreneurship or ICTs. Project consortium will develop 10 innovative cross-platform courses in Latvian and Lithuanian languages having complementary learning materials on TV, Internet & mobile devices.

2014 – Norwegian digital learning arena NDLA Bergen, Norway

“The overall goal for the project is to deliver open and free digital learning resources (OER) of high quality for all, and involve teachers and students in active and participatory learning processes.”

NDLA, which is co-owned by 18 county councils in Norway, is set up to develop open digital learning resources of high quality for all, and NDLA aims at involving teachers and students in upper secondary education in active and participatory learning processes. The current operating budget for NDLA is approx. 62 MNOK. Today, NDLA work with 37 different subjects in upper secondary education. The subjects cover academic specializations as well as vocational education and training. In total, there are about 340 subjects in upper secondary education. The long term ambition is to offer digital learning resources within all subjects. User statistics show a substantial increase in traffic on the NDLA website, and the awareness among key constituents such as teachers and principals is on the rise. NDLA is a national operation that is set up as a virtual organization without a physical headquarter. The administrative and professional support systems are available via local host organisations (e.g. the county councils) or cloud-based applications. The administrative resources are pooled

from existing resources in order to keep the need for investments in administrative software and services at a minimum level. NDLA has about 100 employees from all parts of Norway, of which 35 are full time and approx. 65 are part-time. Most of them are teachers. A substantial part of the funding from NDLA is used in the digital learning resources industry. NDLA has developed an extensive collaboration with content providers and private developers. Approximately 60% of the total funding of NDLA is being used for acquisition of technology services and digital learning resources from the ICT and content industries.

Future work

Practically the network now stands on the good results from the previous completed Boldic network projects, Nord Plus Voxen, Flexible Learning Network (2005-2007) and Nordic-Perspectives online (2008 -2011) and the ongoing project Boldic Open learning resources online. We work for bringing in new players from the Baltics and Nordic countries and from other sectors of educational and working life. It will also improve on the contact system as well as the Boldic-award system. The Boldic-award system – i.e. to hand out a special award to the project found most interesting in the partner countries – has been a success: lots of discussions and many comments. The partners want to make the award system a more continuous process in the cooperation work between the partners and others. The Boldic OLRO project now presents in newsletters of the partners nominations for Boldic Award at an earlier stage than in previous projects.

The newsletters are brought in as complementary judges to the specialists at the organizations. The aim of this is twofold; to make the project people better present their project – better dissemination – as this will improve their chance of getting the prize, and to make more users in more learning organizations active in their demand. Winners as well as “first proposers” will be welcomed at the winning award at the winning conference.

We will discuss and have a summary on:

1. What are innovative online learning projects?
2. How can a network like Boldic, recognize and award outstanding organisations and people in the open and distance learning field?
3. How can we do more lifelong-learning on different education levels?
4. How can we make sure nobody is excluded from the new learning ways in the digital society when we can see the “theme of inclusion” everywhere?

Target groups: Adult learning, higher education, NGO and primary/secondary/upper secondary schools developing networks in the open and distance learning field.

Boldic open online resources online conference, 2014

Boldic Riga Conference October 2014 had the keynote

- “Learning in the 21th Century – Between Masses and Materiality” Niels Henrik Helms, University College Sjaelland, Denmark;
- “Content Availability Powerful Increase by the Use of Multiscreen E-Learning,” A. Kapenieks, Riga Technical University, Latvia;
- “E-Inclusion Processes Research and Promotion by E-Learning,” MeansI. Vitolina, Riga Technical University, Latvia;
- “New Approach for Creativity Monitoring in Virtual Learning Environment,” J.(sr.) Kapenieks, Riga Technical University, Latvia;
- “Piloting of a New Collaborative Reflection Tool in Riga Technical University,” A. Gorbunovs, Riga Technical University, Latvia;
- “Opening up University Courses,” C. Dalsgaard, Aarhus University, Denmark;
- “Quality in OER/OEPE,” Ossian Nilsson, Lund University, Sweden;
- “Mozilla Open Badges for Assessment” H. Põldoja, Tallinn University, Estonia;
- “Quality in online teaching and learning,” T. Slåtto, Flexible Education, Norway;
- “Collaborative OER development,” H. Pirkkalainen, University Jyväskylä, Finland;
- “Internationalization of educational technology and learning contents,” Ph. Holtkamp, University Jyväskylä, Finland;
- “Open education and OER in Lithuania,” D. Ignataviciute, Vilnius College, Lithuania;
- “Summary,” U. Sandstrom, Swedish Association for Distance Education, SVERD and Coordinator BOLDIC, Sweden.

Results

The following topics are discussed and tested in the Boldic network: webinars, preparation, advertising, implementation, common start-up problems and list of meeting and conference platforms.

For more than ten years we have tried out various sites for holding online meetings (Gunnarsdottir, 2012, p.1). and seminars for different collaborative projects in the Nordic and Baltic region. It began with the Minerva project Boldic and the Nordplus projects Nordflex. It continued in Boldic perspectives online and in SKJÁR. Moreover, there has been extensive testing in the Nordic distance learning network DISTANS (an expert group in the Nordic Network for Adult Learning), and in our own organization, Swedish Association Distance Education (SADE).

We organised large and lengthy conferences, both synchronously and asynchronously (Norberg, 2012). We have used many different meeting platforms, hosting meetings with few participants (e.g. project meetings), and with many participants (up to a hundred) (Sahlin & Sandstrom, 2004, p.5). We have tried out using audio and video synchronously, and we have used audio for some and instant messaging (chat) for others.

Summing up, we have now developed a synchronous format that we use quite frequently, the webinar (combination of web and seminar). Several of us have chosen to purchase a license for a particular online meeting platform, while others alternate between a number of free platforms. On the basis of experience gained over the years (Sternier-Kumm, 2011, p.5), we can in an publication set out advice and suggestions on how webinars can be established and implemented. Boldic project want in the future focus on constructivism and transactional learning theory of cognitive space between instructors and learners in distance education (Edström, 2002).

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Partners

- Swedish Association Distance Education (SVERD) <http://www.sverd.se> (project coordinator)
- Flexible Education Norway (FuN) <http://fleksibelutdanning.no/>
- Aarhus University (Denmark) <http://www.au.dk/>
- Vilniaus Kolegija/University of Applied Sciences (Lithuania) <http://www.ekf.viko.lt/>
- BA School of Business and Finance (Latvia) <http://www.ba.lv/lv/>
- University of Jyväskylä (Finland) <https://www.jyu.fi/>
- Tallinn University (Estonia) <http://www.tlu.ee>

OER, OPEN ACCESS AND SCHOLARSHIP IN PORTUGUESE HIGHER EDUCATION

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Abstract

The present paper is part of a PhD research, which is being developed in the scope of the Doctoral Programme in Education, specialisation in Distance Education and eLearning at Universidade Aberta, the Portuguese Open University. The theoretical framework for the research is Open Education, particularly the specific fields of Open Educational Resources (OER) and Open Access (OA). The main objective of the research is to identify and understand the awareness, knowledge and attitudes of scholars in Portuguese public Higher Education Institutions (HEI), regarding OER and OA and, in particular, to compare scholars' awareness, attitudes and perceptions towards OER and OA in the context of their teaching and research practices. This will also allow us to represent the Portuguese reality and, consequently, position the Portuguese public higher education practices within the global panorama and also may be able to inform future decisions, whether institutionally, governmentally or even within a broader perspective. The current paper intends to present the research project and also to reflect the literature review carried out so far, in order to contextualise the research problem and also to describe the methodological procedures defined for the study.

Introduction

In September 2013, the European Commission (EC) presented an action plan to tackle the challenges faced by schools and higher education institutions, to adapt to new technologies and incorporate them in their teaching methods. Opening up Education (European Commission, 2013) was the motto launched by the EC to promote innovation and digital schools in European educational institutions.

In the educational arena, and particularly in the higher education scenario, many institutions have incorporated technology in their management, administration and educational programmes, with examples such as the investment in Learning Management Systems (LMS) and continuous access to library resources in electronic equipment, among other examples. Without questioning the benefits of these initiatives for education in general, and students in particular, these investments have been made within the framework of the dominant educational model, teacher-centred and based on the unidirectional knowledge transfer.

Nonetheless, the development of new models of distance learning and, more recently, the appearance of Massive Open Online Courses (MOOCs) that have had an unprecedented popularity, also unveils the need for changes in the traditional paradigm, particularly in higher education, whose potential beneficiaries are spread throughout the world, and hence the need to “open up education” (European Commission, 2013).

A set of initiatives that has had echo in the domain of open education is the movement of the Open Educational Resources (OER), which have been considered essential in promoting opportunities for pedagogical innovation. However, several studies and authors (Conole, 2012; Wiley & Hilton, 2009; Yuan & Powell, 2013; Ehlers, 2011; Mulder, 2011) confirm that, over a decade after the beginning of the OER movement, neither the traditional business model of higher education nor the pedagogical approach have undergone major changes. Ehlers (2011) acknowledges that this happens because there is still an emphasis on access to digital content, without considering its potential support to educational practices. Thus, it is suggested that we should consider “extending the focus of attention on open education beyond resource access to innovative open educational practices (OEP)” (Ehlers, 2011, p.2).

In this process, teachers play a fundamental role. In the report “Open Educational Resources – Open content for higher education”, presented to UNESCO, Albright (2005) recognises the importance of the involvement of faculty members, whether in “top-down” systems or by means of “bottom-up” initiatives in OER development. Considering the career of faculty, it includes not only teaching activities, but also research work. In this context, their practices are positioned at a research level and open education also has expression through the open access movement. This movement aims to promote free and unrestricted access to scientific and academic literature, upholding the impact of researchers and institutions’ work. In 2003, representatives of important European scientific institutions subscribed the Berlin Declaration on Open Access to Knowledge in the Sciences and Humanities (<http://openaccess.mpg.de/Berlin-Declaration>), supporting the movement and encouraging their researchers to promote free access to their work.

Within this background, it is, thus, fundamental to understand the specific role of scholars and to analyse their educational and research practices within the framework of these global movements and within the current situation of Higher Education Institutions.

Higher Education Institutions at present

Similarly to many other society spheres, Higher Education Institutions have been facing several challenges, which have led to various changes, not only in terms of scholarly practice, but also in the role of higher education in the current 21st century. As put forward by Mackness (2014), “Universities are being hit by disruptive waves”, and this includes factors of diverse origin, such as rising costs of education, decreasing resources in institutions, demographic factors as the decreasing number of students, globalisation and the increasing competition among institutions, no longer in a local or national perspective, but at a global level, not to mention the challenges posed by emerging technologies and environments

themselves. At the same time, these same institutions have a recognised need to develop and improve their curricula, to invest in quality, to take care of their own financial health, to connect with the broader community, to promote students' employability and to adapt to different learning environments and contexts. Among the drivers of change we may also include global economic and social forces that, together with sustainability issues, make it crucial for institutions to find their own path towards innovation, collaboration, transparency and openness, in order to meet the demands of an increasingly international market. These institutions have traditionally been considered as communities of experts, as storehouses of knowledge, which was uni-directionally transmitted by those experts and later certified by the institutions. According to Mulder (2011), "Universities may have changed over the years, but their role has changed little: i) provide knowledge content, ii) offer a learning community that can help students understand the meaning of this content, and iii) certify students who prove that they have mastered this knowledge." However, when looking at the 21st century institutions, we may find a vast array of functions, which include teaching, research, public engagement, policy guidance and also incubators of new ideas and businesses. Technological advances have also contributed to the evolution of teaching and learning processes, with the influence of features such as new hardware and software, ubiquitous computing, cloud computing, sensor technologies, mobile learning, emerging personal learning environments (PLEs) and personal learning networks (PLNs). All of these features have led into the need of identity management and more collaborative behaviours, which, consequently, pressure institutions to increasingly innovate, cross-collaborate and design new business models, focusing on students and innovative practices.

Multidimensional nature of scholarship

Within this context of change in higher education institutions, the role of scholars and how they perform their scholarly practice is also facing opportunities and challenges, particularly when we consider the relationship between information technology and scholarship. In his book *Scholarship Reconsidered*, Boyer (1990) developed the concept of what it means to be a scholar, using the term "scholarship" to identify the several activities carried out by scholars. Based on a broad empirical evaluation of scholars' practice in higher education, Boyer argued that knowledge is not only developed through the traditional practice of research, but also through teaching practice. Therefore, he developed a framework, illustrated in Figure 1, to analyse scholarly practice, based on the multidimensional nature of scholarship.

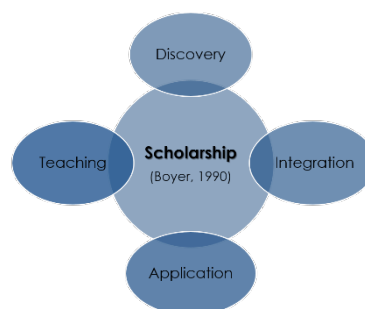


Figure 8. Multidimensional nature of scholarship, based on the framework developed by Boyer (1990)

This framework integrates four different functions: i) discovery, which is connected to the traditional research activity and the creation of knowledge associated to a specific disciplinary field; ii) integration, which focuses on making connections across disciplines and creating knowledge beyond disciplinary boundaries; iii) application, which focuses on using research findings and innovations to engage with the world outside academia, and also includes the service activities connected to the specific field of knowledge and professional activities; iv) teaching, which was not often considered as an important element of professional development and knowledge creation and sharing. All these functions together constitute what Boyer acknowledges as scholarly identity.

Scholarship in the digital age

As abovementioned, the current use of Web 2.0 digital tools has been shaping the research work of scholars in different ways, and, similarly, this influence has been characterised in different terms in the literature, depending on the behaviours or practices each perspective intends to highlight. In this context, scholarship in the digital age has been termed as follows: i) according to Cohen (2007), social scholarship “is the practice [...] in which the use of social tools is an integral part of the research and publishing process [and is characterized by] openness, conversation, collaboration, access, sharing and transparent revision”. The author specifically refers to Boyer’s scholarship of discovery, by emphasising the role of the Web 2.0 affordances have on the process related to research practices; ii) Pearce et al. (2010) define digital scholarship as “more than just using informal and communication technologies to research, teach and collaborate, but is embracing the open values, ideology and potential of technologies born of peer-to-peer networking and wiki ways of working in order to benefit both the academy and society”. This perspective adds to the previous one the teaching component in the notion of scholarship; iii) according to Burton (2009), “the Open Scholar is someone who makes their intellectual projects and processes digitally visible and who invites and encourages ongoing criticism of their work and secondary uses of any or all parts of it—at any stage of its development”; iv) Weller (2011) argues that “digital scholarship is more than just using information and communication technologies to research, teach and collaborate; it also includes embracing the open values, ideology and potential of technologies born of peer-to-peer networking and wiki ways of working in order to benefit both the academy and society.” and finally v) Veletsianos & Kimmons (2012b) state that “Networked Participatory Scholarship is the emergent practice of scholars’ use of participatory technologies and online social networks to share, reflect upon, critique, improve, validate and further their scholarship.” These authors also argue that the way digital technologies are used by scholars implies a set of practices and dispositions that have the potential to change the way scholarship is considered.

Within this framework, even though scholarship has been termed differently in the literature, the apparently diverse definitions place the focus beyond the use of technologies, highlighting the values that are embraced and promoted by that same use. What is common to all definitions are the principles of openness, collaboration, networking and sharing, and this represents a deep contrast to the traditional scholarly practices, usually portrayed as isolated

processes, neither conversational nor participative. Thus, scholarship in a digital age is influenced by different factors, such as networking, sharing of digital data, increased collaborative work and increased emphasis on openness and benefits from the Web 2.0 affordances, by connecting traditional formal scholarly practices with more informal, open and collaborative practices.

The scholarly communication cycle

Taking into consideration the scholarly communication cycle proposed by Czerniewicz et al. (2014), all stages of the research process are influenced by the increasing use of the Web 2.0 technologies. The authors propose a knowledge creation and dissemination model, which focuses on the research and dissemination activities performed by scholars. This model outlines the main elements that are part of the traditional scholarly communication cycle, which are i) conceptualisation; ii) data collection and analysis; iii) articulation of findings; iv) translation and engagement. In the authors' perspective, the traditional model of the scholarship cycle usually begins with conceptualising an issue, which involves theoretical tasks such as writing proposals or literature reviews and is traditionally an individual and private stage of the process. The second stage involves some type of data collection, followed by data analysis and, although the data may assume different formats, they are traditionally not shared and may not be digitised. In a subsequent stage, this data analysis leads to findings, whose outputs usually represent stable, text-based and final authoritative versions, whose dissemination is normally the responsibility of publishers. If the research is related to the teaching activity scholars perform, there is also an engagement phase, which may imply the release of textbooks or access to online resources to a clearly demarcated uni-dimensional audience, represented by course students. Figure 2 illustrates the changes that have been shaping each stage of this model, as a result of Web 2.0 technologies and the affordances offered by digital forms of content and communication.

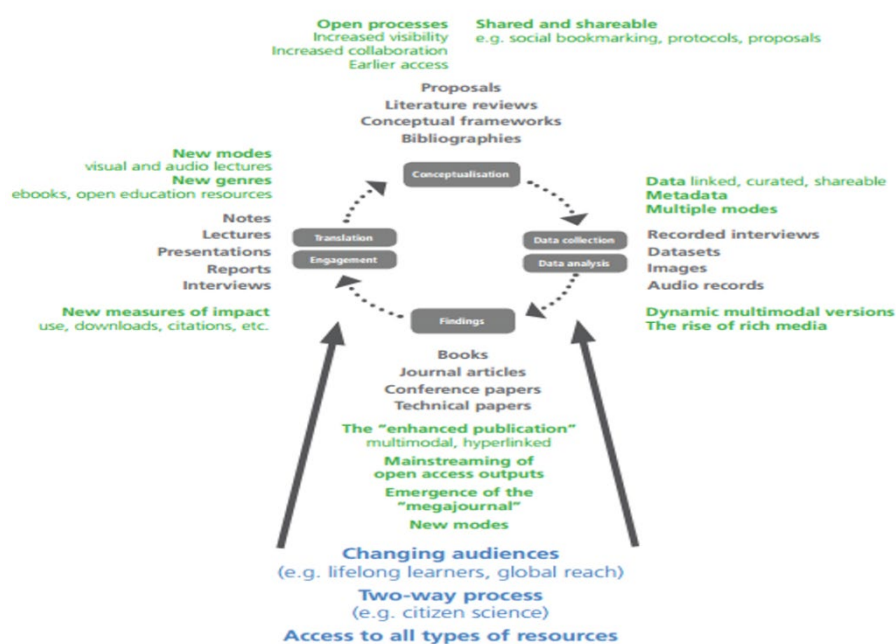


Figure 9. The changing scholarly communication cycle (Czerniewicz et al., 2014)

As shown in the previous figure, all stages are influenced in the technological age: at the conceptualisation phase, activities become shared and shareable and the process is increasingly collaborative and open. At the next stage, the multimodality of the web allows dynamic versions of data, which are linked, curated and shareable. The outputs have also become multimodal and hyperlinked, with open access publications becoming more frequent, with audiences no longer being predefined and in a process which is no longer unidirectional. Consequently, the engagement stage of the cycle also reflects new modes and genres of resources, allowing the development of open textbooks and open educational resources, which, in turn, are challenging the role and delivery modes of higher education institutions themselves.

Coherence of open domains

Even though there are multiple and diverse perspectives on how to characterise scholars, scholarship and the scholarly cycle, what is common to all perspectives are the concepts of sharing, networking and openness. As Alevizou and Conole (2010) refer, openness is “a trend, both in terms of the production and sharing of educational materials, as well as making research publications (and even research data) freely available”. Similarly, Veletsianos and Kimmons (2012a) state that open scholarship refers to “teaching and research practices that espouse openness”. Similarly, the different ways of characterising openness depend on the “open” aspect each perspective intends to highlight or, as Corral and Pinfield (2014) put it “the various arenas of open activity have generated a range of definitions”, such as open data, open educational resources, open source, open systems, open research, open science and open content, among other concepts. The different “open” domains have developed through a wide range of different initiatives managed at various levels and have normally been followed by different communities of practice, often with little connection between them. For example, OA has been promoted by various stakeholders, including funders, librarians, and researchers in particular disciplines; whereas OER has typically been promoted by learning technologists and educationalists. In their study, Corral and Pinfield (2014) suggest that developing the convergence of open domains and recognising common benefits, without forgetting their particularities will bring additional advantages both for institutions and scholars.

Research problem

Within the previous theoretical framework, the present research intends to address the following main questions:

- What are the scholars’ practices towards Open Educational Resources (OER) and Open Access (OA)?
- What is the influence of scholars’ awareness, attitudes, perceived incentives, constraints and values regarding OER in their practices towards OER?
- What is the influence of scholars’ awareness, attitudes, perceived incentives, constraints and values regarding OA in their practices towards OA?
- What is the relationship between scholars’ awareness, attitudes, perceived incentives, constraints and values regarding OER in their practices towards OER and scholars’

awareness, attitudes, perceived incentives, constraints and values regarding OA in their practices towards OA?

Methodology

The methodology of this research will be mainly qualitative, with a mixed methodology approach, using both qualitative and quantitative techniques at different stages of the research. Authors such as Moraes and Neves (2007) and Creswell (2003), among others, suggest that there are cases when it is an advantage to combine qualitative and quantitative techniques, as combining the two may provide a better understanding of the research problems. In a first empirical stage, data will be collected through a questionnaire survey, targeting teachers/researchers of public Higher Education Institutions in Portugal. Participants will be selected through a criterion sampling process: i) they have to be researchers recognised by the Foundation of Science and Technology (FCT), the Portuguese research funding body; ii) they belong to the Social Sciences and Humanities field, as it is both the researcher's specific field of work and it is also the field of the PhD programme; iii) in the last two school years, they have had to participate in funded research projects and must have had teaching service as well. Regarding the questionnaire itself, the main dimensions are based on previous national and international surveys, concerning OER and OA in Higher education institutions and the indicators will be adapted, based on an analysis of common grounds for comparability in the measured dimensions.

After collecting and analysing the questionnaire data, a second stage will be carried out, with the objective of achieving a deeper understanding of the data collected in the previous stage, by means of focus groups. The purpose of the focus groups is to corroborate possible findings and explore in greater depth the relationships suggested by the previous analysis.

Conclusion

The revision of literature carried out so far has allowed us to preliminarily acknowledge two aspects: first, that there aren't many studies focusing on addressing the awareness, knowledge and attitudes towards OER and OA practices, even though they represent two functions of scholarly practice; second, that some Portuguese institutions have participated in several initiatives regarding the two movements, but it is necessary to understand the current situation of the Portuguese scholars in the movement of openness to knowledge.

It is also important to refer that the research is currently in the stage of identifying the main dimensions and indicators as part of the questionnaire construction.

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THE IMPLEMENTATION OF ICT IN SECONDARY SCHOOLS IN CATALONIA

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Theoretical framework

Schools and Education in the 21st Century

One of the features that characterises our society is that ICT is present worldwide, specially in all productive processes and daily activities [1, 2, 3, 4, 5]. In the last decades there have been deep changes, such as the uprise of the world wide web and globalization [6], along with the convergence of new forces, including knowledge tools, thinking tools, digital lifestyles and learning research, that have led to new learning ways to live in the 21st century [7]. Furthermore, Europe today is immersed in a transformation period, due to an important economic crisis that has made the European Union to establish strategies to foster an intelligent, sustainable and integrating economy [8].

As far as education is concerned, the European Union has developed two strategic frameworks in 2000 and 2010 to improve the quality and efficiency of school systems and the access to education and training [9]. In Spain there have also been several national programmes of educational reform that follow the European strategies [10, 11, 12]. Europe 2020 is the EU's growth strategy for the present decade with specific targets in education that focus on learning as a continuous process associated to lifelong learning, learning ecologies, invisible learning and student centred learning [13, 14, 15, 16] so as to overcome what many authors have defined as a crisis of traditional educational systems [17, 18, 7, 19].

Students need new skills and competences to be fully integrated in the 21st century society; this is why ICT must be integrated in curricula [20] and why one of the key points in European education strategies is digital literacy, which is defined as the ability to effectively and critically navigate, evaluate and create information using a range of digital technologies.

The implementation of ICT in schools has been enhanced by European, national and regional programmes and laws. In Catalonia, the use of computers in schools started three decades ago. The most recent and important initiative has been the programme Educat2.0. It provided schools with interactive whiteboards in all classrooms, high-speed Internet connectivity and grants for students to buy a personal laptop [21], this is why it was also known as 1:1.

ICT and School Organization

The educational legal framework in Catalonia and Spain integrates the eight key competences established by the European Union at the end of the 1990s [22, 23, 24]. The EU defines a key competence as “*a combination of knowledge, skills and attitudes appropriate to the context*” [22], that is, the integration and application of theoretical and practical knowledge in a practical way to solve problems and react appropriately in settings outside the academic context. One of the key competences is digital competence, which “*involves the confident and critical use of information society technology (IST) and thus basic skills in information and communication technology (ICT)*” [22].

Despite the use of ICT in schools, there has been neither improvement nor innovation in the teaching and learning processes [25]. To take advantage of the educational opportunities of ICT, schools need both a global educational model at professional development, organization and curricular levels [26] and a strategic and effective use of ICT to improve outcomes [17, 19, 27]. Following this idea, the National educational authority in Catalonia has developed a programme to set strategic plans to implement ICT in schools [28].

E-Maturity in Schools

When organisations make strategic and effective use of ICT to improve educational outcomes, they can be considered e-mature [29, 30, 31]. To study e-maturity four dimensions have been set: infrastructures and digital culture, school organization and management, teaching processes and professional development [32, 33, 34]; but to become e-mature, schools pass through different stages of ICT implementation: initial, e-enabled, e-confident and e-mature [33, 35].

These levels of e-maturity can be explained as follow: In the initial level, schools have a basic ICT infrastructure and have started to use digital resources in teaching and learning, but there is little reflection on ICT use. Teachers have followed some training courses but less of 50% of the teaching staff are skilled enough to use ICT effectively.

E-enabled schools have a better ICT infrastructure and have started to develop ICT plans. Teachers integrate ICT in the curriculum and use digital resources more frequently. In this level, schools have started their way to e-maturity.

E-confident schools have digital classrooms, a reliable network and resources are available throughout the school and remotely. Technical support is provided. ICT is integrated into school through ICT plans, which are led by the head teacher. Teachers have participated in ICT professional development programmes and they use a large variety of digital resources. Students use ICT regularly with their own portable device.

Finally, in the e-mature level, all e-confident level features are reinforced and ICT is embedded in all the school. There is a shared ICT vision by all stakeholders. All teachers are ICT confident and use ICT in their daily plans. Students use ICT to support and assess their learning.

It has been shown that the frequency of use is irrelevant [36, 37]. However, the role of the principal [38, 39, 40] and the quality of teaching [39] have arisen as key elements in the setting of e-maturity in schools.

Methodology

The main research questions of this study are the following:

- How are schools organized to take advantage of the use of ICT and what is the role of the head teacher?
- Which educational practices empowered by the use of ICT are used in schools?
- How is ICT used to progress in their e-maturity level to foster the positive impact of ICT in the teaching and learning processes?
- How can educational policies enhance the school vision of ICT as an agent of educational innovation?

To answer these questions we have followed an inductive and holistic qualitative perspective [41, 42], which will be complemented with quantitative instruments according to the kind of data that we want to collect. We align this research with the interpretative paradigm, which states that reality is an observable subjective element built in a social way [43, 44]. But we also believe that reality has objective structures and features, whose critical reflection provides knowledge, that is, the socio-critical paradigm [44, 45].

Although these two paradigms may have a different ontological and epistemological basis, both can be used [46] to complement the research process [47]. From an interpretative perspective, we want to describe and analyse the organization of ICT in different schools and from a socio-critical perspective, we want to reach a global vision of reality, identifying key factors in the use of ICT in schools, from which guidelines for other schools can be developed.

Several methods and techniques are used to collect and analyse data. We use a triangulation of methods based on questionnaires, interviews, documentation analysis and focus groups to check data objectivity [48]. At present, three secondary school leaders have been interviewed and surveys for students and teachers have been designed and validated.

The research is based on three study cases. They are three schools of secondary education with technology rich environments that are recognized by their pioneer use of ICT. The school leaders of these schools have already been interviewed. The instrument that has been used is a semi-structured interview, which is useful to collect data in depth [41]. The interviews have a planned script to avoid bias [49] and unstructured responses were expected. The objectives of these interviews were the following:

- To know the school vision and organization of ICT.
- To know the role of the school leader in the management, planning and implementation of ICT.
- To know how the school evaluates the use and impact of ICT.
- To know how national educational policies can guide the use of ICT in schools.

Analysis of the first results

Although this PhD research has not been finished yet, we can explain the preliminary results of the interviews to the three school head teachers. We present below the findings of these three interviews, organized into four categories: school organization, school leadership and management, impact and evaluation of ICT, and educational policies.

School organization

In the first study case, the school started to implement ICT more than ten years ago as an initiative of the head teacher. She defines the school as innovative and in a continuous process of improvement. They embed ICT into the curriculum and the pedagogic school project to make them invisible, using a wide variety of digital tools. The head teacher believes that ICT must be present in the school, as they are in everyday life and they must foster learning inside and outside of the school.

In the second study case, the school started to implement ICT more than ten years ago also. The head teacher defines the school between innovation and tradition, where ICT is important methodologically. They make efforts to achieve a digital mentality and look after that teachers follow this path, using a wide variety of digital tools. The head teacher believes that ICT are essential and they have great potential in connecting education with reality.

In the third study case, the school is a new school and they started with ICT being a strategic feature of the school. They define themselves as inclusive and innovative. ICT is completely embedded in the school and they allow students and teachers to do things that couldn't be so well done before. They use a wide variety of digital tools and resources as an input to look up for information and also as an output for students' productions.

School leadership and management

In the first school there is an ICT committee in charge of making decisions and convincing teachers through improvement plans. They have made strategic decisions such as getting rid of textbooks and organising specific teacher development courses. They think that teachers must be good ICT users and be open to professional improvement.

In the second school there is also an ICT committee. They share information with teams of teachers to reach agreements on how to use ICT. The head teacher thinks he must be a keystone on this topic to make it work. They organise internal teacher development courses to support teachers. They think that teachers must have an open mind and be willing to learn.

In the third school there is also an ICT committee to detect problems and solve them. The head teacher is a keystone; he has made important decisions such as using iPads and getting rid of textbooks. They support staff with teacher development courses and individual advising. They think that teachers must be ICT users and be open and willing to learn.

Impact and evaluation of ICT

In the first school, they have many indicators to measure progress. They pass a questionnaire to teachers and students every term. Their students are very good at digital literacy and have very good academic outcomes but they cannot affirm whether it is because of the use of ICT.

In the second school, they pass a questionnaire to teachers and students at the middle of the school year. Their students have good digital skills, but they don't know the influence of ICT in school results.

In the third school, they pass a questionnaire to teachers, students and families at the end of the school year. The head teacher says that students have better literacy and numeracy skills and thanks to the use of ICT, they can know students better and personalize their learning.

Educational policies

The head teacher in the first school thinks that at present there are few educational policies that foster the use of ICT. They would like more help from the educational administration in terms of advising and support

The head teacher in the second school thinks that the educational administration should encourage the use of ICT in schools. He also affirms that the head teacher is also responsible for it.

The head teacher in the third school thinks that educational policies must be based on defined actions and at present there aren't. He thinks that the educational administration should stimulate the use of ICT and explain the benefits of it.

Table 1: Preliminary results for each study case

	Study case 1	Study case 2	Study case 3
School Organization	<ul style="list-style-type: none">- Innovative school- Make ICT invisible- Learning inside and outside school	<ul style="list-style-type: none">- Between innovation and tradition- Efforts to achieve a digital mentality- Great potential of ICT	<ul style="list-style-type: none">- Inclusive and innovative school- ICT completely embedded
School Leadership & Management	<ul style="list-style-type: none">- Existence of ICT Committee- Strategic decisions by the committee- Specific teacher development courses- Teachers good ICT users and open to improvement	<ul style="list-style-type: none">- Existence of ICT Committee- Teachers reach agreements- Internal teacher development courses- Teacher willing to learn	<ul style="list-style-type: none">- Existence of ICT Committee- Strategic decisions by head teacher- Teacher development courses and peer advising- Teachers good ICT users and willing to learn
Impact & Evaluation of ICT	<ul style="list-style-type: none">- Indicators to measure progress- Term questionnaires- Good academic outcomes	<ul style="list-style-type: none">- Mid-year questionnaire- Good digital skills	<ul style="list-style-type: none">- End-of-year questionnaire- Better literacy and numeracy skills thanks to ICT
Educational Policies	<ul style="list-style-type: none">- Few educational policies- Need more advise from administration	<ul style="list-style-type: none">- Responsibility divided between administration and head teacher	<ul style="list-style-type: none">- Need of defined actions

Discussion and first conclusions

The first analysis of these three interviews to school head teachers seems to confirm some points of the studies on e-maturity and the role of principals in the implementation and use of ICT in schools. From the interviews, three main topics arise: the vision of ICT, the role of the principal and the importance of teacher professional development.

In these schools there is a shared clear vision of ICT by all stakeholders, which is considered one of the indicators of e-mature schools [31]. ICT is embedded in their daily activities using a wide variety of digital tools and resources to support, facilitate and personalise learning [33]. The reason why these schools started to use ICT is to narrow the gap between school and present society, so that students can master the skills needed in the 21st century [7]. This makes them consider themselves as innovative schools [34].

The head teacher in these schools has a key role in the implementation of ICT [40, 31, 35]. In the three schools, the head teacher was the person who decided to start using ICT in the teaching and learning processes, but they have developed a distributed leadership [33]. All of them have an ICT committee to make decisions and they use both a top-down and a bottom-up approach to share information and decisions [28, 40].

Finally, the three head teachers point out the importance of teacher professional development and teacher support [33, 34]. Three schools have organised ICT professional development activities for their staff. The three agree with the fact that the worthiest is in-house training and individual support for teachers, although each school has organized their professional development training according to their resources and needs.

As we have already said, these are the results and conclusions of the first analysis. The data must be completed and verified with the other instruments explained in the methodology section.

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LEARNER SUPPORT IN DISTANCE EDUCATION: UNLOCKING THE POTENTIAL OF PUBLIC LIBRARIES IN SUPPORTING TEACHING AND LEARNING IN OPEN AND DISTANCE LEARNING

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Abstract

This study examined the nature of services and facilities available and accessible in public libraries to ODL students in sub-Saharan Africa and the challenges these services face. Library services are central in teaching and learning processes because they expose the students to a variety of resources which facilitate in-depth study and lead to development of intended competencies. However, according to Pernell (2002), traditional library services often fail to adapt to the needs of Open and Distance Learning students especially in dual mode universities. This in the end affects students' final grades as well as the quality of education they receive. Using a cross sectional survey, from 422 respondents who include students, staff (both on campus and off campus) and librarians, data were collected through questionnaires, interviews, focus group discussions and documentary analysis. The findings reveal that due to inadequate library resources in study centres where ODL students are meant to receive remote support, the students have been utilizing library resources from the public libraries. This support from public libraries however needs to be acknowledged and fully integrated in the University policy provision for effective collaboration and knowledge sharing to ensure smooth coordination of library activities. This paper seeks to examine the potential of public libraries in supporting distance learners in Makerere University and the need for policy to guide the collaborations and while sharing library resources.

Introduction

In Open and Distance Learning (ODL), the majority of educational communication between teacher(s) and student(s) occurs non-contiguously (at different times and in separate places) (Perraton, 1993). This separation is what Moore (1993) calls transactional distance. According to him "it is the physical separation that leads to a psychological and communication gap, a space of potential misunderstanding between the inputs of the instructor and those of the learner". This distance is determined by the amount of dialogue which occurs between the learner and the instructor and the amount of structure which exists in the design of the distance learning course. To close the communication gap, Moore (1993) proposed three models of interaction essential in ODL. First is the Learner-Teacher Interaction model, which provides motivation, feedback and dialogue between the teacher and students. The Second is

Learner-Content interaction, where students obtain intellectual information from study materials. Third is the Learner-Learner interaction, which is the exchange of information, ideas and dialogue that occurs between and among students about their learning. Interaction at all levels is fundamental to the effectiveness of ODL programmes.

Student support services need to facilitate all three components while the learner is remote from the instructor. Tait (2000) defines student support services as a range of services for individual students and groups of students, including study materials, tutoring, library, counselling, study centres and elements of continuous and individualized correspondence teaching. Student support is universally identified as the most critical factor influencing effective teaching and learning in ODL programmes (Moore, 1996).

Although other research has examined the role of libraries in ODL, especially those on campuses (Mayende & Obura, 2013; Kawalya, 2010; Middleton, 2005; Watson, 2003; Brophy, 1992) there is little research on libraries off-campus and specifically the significance of public libraries in supporting ODL. Tipton (2008) contends that the constraints that motivate students to opt for ODL are the same ones that limit their ability to use a centrally, often urban-located, library. They are likely to be working full time, and have family commitments, in addition to their student responsibilities; these obligations influence their access to study materials, both in time and space (Aguti, 2003). They therefore rely on library services at remote sites, interlibrary loans or travel to the main campus. ODL institutions commonly try to open study centres near to the students to offer academic support, which will often include library services. Library requirements for distance learners are threefold: the need for materials, facilities, and information and user services (Jagannathan, 1989). Rather than being expected to go to the library whilst in ODL, the library should go to the students, and the strategies to “take” the information to the students need to be initiated and deployed.

In this particular study, we will examine the role of library services in supporting distance learners. With non-traditional study having rapidly become a major element in higher education, there is greater recognition of the need for library resources and services at locations other than main campuses and demand for equitable services for all students, no matter where the “classroom” may be (ACRL, 2008). ODL students are entitled to library services and resources equivalent to those provided to students in conventional systems. However, according to Stephens (1996), traditional library services often fail to adapt to the needs of ODL learners especially in dual universities. For instance, they fail to provide off-campus library services like region-wide borrowers’ cards and consortia membership between academic libraries. Parnell (2002) suggests that it may be unethical to offer a qualification to students without providing them with adequate resources for study. Hence, to protect the credibility of distance learning courses, adequate investment in library services is needed by university administrators, both on and off campus.

The role of public libraries in ODL in Uganda

At Makerere University, library services have traditionally been offered through a book bank system where core text books are acquired by University departments and study materials are produced specifically for distance learners. Library services therefore are offered through the departmental book bank at the main campus, in regional university study center libraries, and sometimes in public libraries. According to Mayende & Obura (2013), the department has an estimated collection of 350 titles of study materials, with 28,000 copies lent out to students on the main campus and in collaborating libraries. As much as the department has tried to take the services nearer to the students, complaints have consistently come from students regarding the inadequacy of library services upcountry. This is mainly because the good text books are in the main library at the main campus and therefore cannot be accessed easily by ODL students. The University has also subscribed to several online data bases but the ICT infrastructure is not available in the upcountry centres and therefore ODL students cannot access these resources (Mayende & Obura, 2013).

According to Bbuye (2010) and Mayende & Obura (2013), with the exception of the upgraded centres of Fort Portal and Jinja, ODL library services in upcountry study centres of Makerere University in Uganda are neither equipped with substantial collections nor provide students with appropriate services. Alongside poor Internet access, and inadequate or outdated study materials, students struggle to get relevant resources to complete assignments and many do examinations without supplementary reading, which consequently affects the quality of not only their grades but also the education they receive. Lack of access to library services and related instructional resources is perceived to be an obstacle to starting or expanding ODL programmes (Keith, 1998).

Given the above, many students have found support and assistance from public libraries across the country. According to Meredeth (2010), public libraries have always supported distance learners as members of the community, being entitled to support like anyone else. According to UNESCO, a public library is the local centre of information, making resources (e.g. books, reference collections, computer and Internet access) accessible to the general public. In an effort to support ODL students, Makerere University has been collaborating with public libraries to offer library services. Libraries may also serve as remote sites for courses. Keith (1998) adds that public libraries are often critical to the development of ODL as they enhance teaching and learning processes. However, in Uganda, such support is not fully integrated in the University's provision, whereas better coordination may help secure effective student support. This paper therefore examines the place of public libraries in supporting distance learners in Makerere University, Uganda.

Some public libraries have proven more effective in supporting learners due to their consistent distribution across the country, and the extent of services and facilities they can provide. They have regular opening hours, including at the weekend, reading space, a variety of reading materials (including research reports, government documents and reference books)

and internet facilities which provide e-books and online resources. The Makerere University library collections are also accessible through its Online Catalogue which provides web-based access to a broad variety of electronic databases viewed as abstracts and full text. These however, are not accessible to most of the ODL students upcountry (Mayende & Obura, 2013). Meredeth (2007) confirms that public libraries have always purchased data bases or journal subscriptions or reference books specifically with students' needs in mind. However, she contends that there is a limit to which public libraries can support university students without better collaboration between library and the university.

As noted earlier, ODL students are unique and have different needs which cannot fit within the existing university infrastructure and policies (ACRL, 2008). Therefore in ODL, modalities and strategies have to be devised by librarians, distance educators and administrators to take library services to the students (Watson, 2003). Borrowers' learning should not be inhibited by lending restrictions, and study materials should be provided in as many locations as possible (Aguti, 2003). Many institutions offering ODL collaborate with public libraries by linking students to their university libraries electronically and by providing deposit collections at public libraries remotely (Meredeth, 2007).

In this study, we examine the nature of support services offered by public libraries to Makerere University ODL students in Uganda. Our motives for such a study reflect a drive within the University to increase the quality of ODL education. That said, utilizing public libraries as facilitators to ODL may provide a way to support ODL across similar contexts, particularly in those where online access is low in rural communities. We focus in particular on the following research questions:

1. What is the nature and status of academic support services to ODL students offered by public libraries in Uganda?
2. What affects the utilization of study materials and other resources in public libraries in Uganda?

Methodology

The study employed a survey research design which used both qualitative and quantitative approaches to data gathering and analysis. To try to make the study representative, data were collected in the four regions of Uganda (central, East, North and West). Four public libraries were visited – one from each region. These libraries were selected purposefully to match those areas with the greatest concentration of ODL students. Cluster sampling was used to select the 300 students out of 3500 on the B.Ed. programme offered through ODL in Makerere University. The clusters of B.Ed. students included 90 first years and 210 third year students who were asked to share their experiences regarding student-support, and specifically library services upcountry. Thirty key informants were also purposively selected to participate in the study. These included seven librarians, five lecturers, ten students and six members of staff from the ODL Department.

Information from respondents was gathered using a structured questionnaire, interviews and Focus Group Discussions (FGDs). FGDs were held in each of the public libraries visited and the purpose was to solicit in-depth information from a cross section of key informants. An observation check list was also employed to establish the actual facilities available to students. For purposes of triangulation, relevant documentary evidence was used to support and validate information obtained using other techniques. Interview and focus group dialogue was recorded, categorized and thematically coded in order to draw conclusions. Some numerical data were also analyzed with descriptive statistics.

Analysis of findings

In this section, the findings of the study are presented and discussed in relation to the research question.

Research Question One: What is the nature and status of academic support services to ODL students offered by public libraries in Uganda?

Students across Uganda were asked to indicate the services and facilities available in public libraries which they had used to facilitate their learning. Results show us that some students have been utilizing the services and facilities in the public libraries, especially the internet and online data bases (74%). They also benefited from technical staff (73%), reading space (63%) and study materials (42%). However, a large percentage said there are no study materials (58%) and supplementary reading materials (63%). Interviews with students who did not visit the library revealed that many students were not aware of the services and facilities available in the public libraries. These responses from students will be analyzed together with the observations and interviews carried out with the librarians and programme administrators in the following section.

Research Question Two: What affects the utilization of study materials and other resources in public libraries in Uganda?

To answer this question, observations and interviews with students, librarians and programme administrators were conducted to establish the determinants of library utilization. Some of the factors raised are discussed below.

Awareness

Analysis of the students' responses show that a good number of students are not aware of the existence of the public libraries and the services therein and therefore made minimal use of them. For example 58% of them did not know that study materials had been deposited in the public libraries and 63% had no idea that they obtain supplementary materials from the public libraries. This was very prominent in Northern and Eastern Uganda as librarians reported that the students had not visited the library in the last four years. This was mainly attributed to breakdown in communication among students, programme administrators and public libraries. The librarian in Fort Portal said; "We have resources here which can be utilized by

the ODL students but they do not come! The university should communicate to the students to come and utilize these facilities.”

There is therefore need to improve on communication to students about the existence of public libraries so they can be utilized to full potential by ODL students. Emphasis should be given to communicating with students through a variety of media, using available technologies like mobile phones, networks and systems to maintain contact with students (ODeL, 2010). The relationship with other stakeholders like librarians should be nurtured as well to ensure a smooth running of activities by partner institutions. Middleton (2005) observes that if such relationships are not well handled, collaborations can be hindered by factors like inflexible organizational management structures and narrow administrative vision (Middleton, 2005).

Presence of study materials

Results indicate that 42% of the students confirmed that ODL study materials were available in the public library, while 58% claimed they were absent. The quality of study materials available to the students is also important as ordinary text books may not facilitate learning in ODL. In other words, they should be in a self-study interactive format whether they are print-based or technology mediated. Use of ordinary books and articles may turn out to be counterproductive, as students claim they are difficult to comprehend without the guidance of the tutors. Essentially, the students prefer the study materials that have been specially prepared for their learning since they are easy to understand and have been prepared for that purpose. ACRL (2008) further advises that study materials should have sufficient quality, depth, number, scope, and currency to meet all students' needs in fulfilling course assignments, meet teaching and research needs, and facilitate the acquisition of lifelong learning skills.

In this respect, students were further asked to indicate multiple responses whether the study materials given to them had interactive features to facilitate learning. Here, students were asked to tick the option that best described their opinion. The findings revealed that the major characteristic of the learning materials was to provide examples (16%). The learning materials also contained statements of what students were to learn (15%), served as study guides (14%), and contained summaries (13%), among others. Usually, where study materials are not written in an ODL mode, the material should be accompanied by a study guide to facilitate learning. During the study, all the students interviewed (100%) reported that they are not given any study guides to accompany the study materials that are not especially developed for distance education students. In the absence of study guides, the students are left to use the study materials as they are and yet they are not interactive to facilitate learning.

In view of the challenges regarding the quality of study materials, programme administrators suggested the need for more facilitation to train tutors and writers in materials-development, so as to improve the quality.

Variety of study materials

The study found out that the reading materials in the public libraries were mainly developed print materials, as reported by 67% of first years and 76% of the third year students. There were no audio or video materials. The programme depends mainly on the print study materials which take the forms of text books, readers, study guides, handouts and extracts from various literature sources and specially designed materials, written in a style appropriate to distance learners (Aguti, 2004). There is a danger, however, in relying on only print materials because according to Bates (1994), print promotes accumulation of facts and information but not critical thinking. The programme administrators are therefore encouraged to use blended methods of teaching materials to enhance acquisition of the relevant competencies.

Availability of supplementary materials

The students (74%) who visited the public library also reported that the study materials deposited there are outdated and therefore not very helpful while doing their research. They however, applauded the library for providing a variety of references, from both the shelves and the internet, which they have utilized as supplementary references.

In this respect, the librarians requested that the university should send them up to date study materials to facilitate learning. Smith and Dunn (2001) emphasise the same when they observe that the currency and relevance of study materials in ODL was considered a positive factor because learning is immediately reinforced through application to real situations.

Information and communication technologies (ICTs)

New developments in ICT offer a lot to ODL in terms of information retrieval and access, interaction and collaboration. The internet broadens the scope of ODL by extending the time and location boundaries in which courses can be delivered (Moore & Lockee, 1999). All the public libraries visited had ICT facilities like computers and the internet, which could be utilized by students while doing their research and typing services. The librarians also reported that through the national library board, they have subscribed to some online data bases like EBCO, Emerald and some African journals which are accessible by their readers.

The students who had visited the library (74%) confirmed that they had access to IT facilities, including the internet. They appreciated electronic materials although they did not have access to the data bases the university subscribes to because there is no arrangement by the university to have them accessed through the public libraries. The students using the library did have access to these computers to do their in-depth research using online resources. However, Mayende and Obura, (2013) contend that with such infrastructure in place, electronic delivery of information materials from the main campus to the public libraries is possible, but only if the working relationship between library and university is streamlined. Without free provision of ICT services, students suffered from financial hardship, which could form a barrier to participation. One B.Ed student who was not aware of the library

services lamented: “We have been spending a lot of money in internet cafes to surf and do research when we could access the internet cheaply here!” This is a sign that the students are not well informed of the resources available to them at these public libraries.

Librarianship

The students (73%) and evidence from documentary analysis indicate that the public library had trained staff in the field of information science and competently served students. According to records from the Public libraries website, all public libraries are being manned by trained librarians. The study also established from the libraries visited that the officers in charge had at least a diploma or degree in library and information science. This was also seen from the way study materials deposited for students were well organized on the shelves, but staff lamented that only a few students had actually borrowed books. They also lamented the poor reading culture among the students; “Our students do not have a reading culture; even the available resources are not fully utilized” (Librarian from Fort Portal).

Qualified personnel are very important because they can ably assist students to source the references and journal articles from the data bases. In case of effective decentralization of library services including online materials, these staff can assist the students competently because of their familiarity with the software (Xingfu, 2000). In relation to academic support, the study found that public libraries had more knowledgeable staff than the centres. According to Mayende & Obura, (2013) public libraries have trained staff who can direct students how to access on line data bases, direct students to materials contained in general and research collections as well as resources referred to in reading lists. According to ACRL (2008), in some cases the collaborating institution must provide professional and support personnel with clearly defined responsibilities at the appropriate location(s) and in the number and qualifications necessary to attain the goals and objectives for library services to the distance learning program.

Reading space

The study found out that public libraries have ample reading space which ODL students utilized for their reading, with 63% of the students who have been visiting the public libraries reporting a conducive reading environment. Many of these students, as already noted, may not be able to read in their homes or where they work because of family or employment obligations. Many of them claim to do serious reading and studying only when they report for face to face tutorials at campus. One student said; “When am at home I don’t have time to read because from school I have to attend to my family chores and with children at home you cannot concentrate to read”.

Remoteness from the library

Accessibility to the public library is also a factor that can affect its utilization. This is mainly a problem because they are all located in the urban centres and some students find it difficult to reach them because of poor roads and poor transport. This was vividly clear with students in

Northern Uganda who were neither close to Gulu nor Lira centres, because they were coming from Apac. One B.Ed student from Apac said: “From my home to Lira town is about 85 miles and I use two taxis! I can only come to the public library only if I am sure the study material I need is there.”

Conclusions

The study established that over ten years ago, the university signed a memorandum of understanding with public libraries to deposit study materials in the libraries, to be accessed and utilized by ODL students. This arrangement has been effective in supporting ODL students because public libraries are widely spread across the country and almost all students can access them. Through this relationship, students have been able not only to access study materials but also get access to other services in the public library. These among others include reading space, computers, internet, and supplementary reading materials from the shelves and also online resources from the data bases they subscribe to. However, the study also found out that the study materials deposited in these libraries are outdated and no longer very helpful to the students. This could have been due to the fact that over time the working relationship between the two institutions has become weak, mainly due to failure to renew the contract, making it difficult for any further study materials deposits to be made at the public libraries.

Recommendations

- The University should renew the contract with public libraries so as to establish formal collaboration and facilitate smooth working relationships. Inter-library cooperation is not new in education and particularly in ODL. Morrisett and Baker (1993) contend that the back bone of ODL library services is embedded in cooperation of libraries at a local, national and international level.
- Up to date and relevant study materials should be deposited – preferably those written in an interactive manner.
- The university should give public libraries access to its data bases for ODL students to access wherever they are.
- Programme administrators should avail students with relevant and regular information about public libraries' locations and the services available.
- Through public libraries, the university could also work towards decentralizing electronic study materials so that students upcountry can access these resources.
- The University should increase the allocation of funds towards ODL activities as well as continue lobbying the development partners to support the revamping of library services for ODL students.
- The relevant and up to date study materials need to be developed for students and supplementary reading materials bought or adapted.
- ICT infrastructure is required up country to provide access to the Internet. Huge investment is required in developing study materials for distance learners.

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HIGHER EDUCATION IN BRAZIL: ACADEMY AND OPERATION, A CHALLENGE OR A PARADOX?

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Information (and consumption) Society: – Is that a good thing, by the way?

In a world where the “means” becomes the “end”, when I refer to the “massive use of technologies”, determining the speed of changes, behaviour, mood, or even economic level, being such phenomena originated from needs or fads, certain things are enhanced, while others, such as a country’s Education take a crucial time to endure any kind of change (exceeding patience or survival).

There is no need to bring up the famous jargons applied to Education, especially here in Brazil, where it has been facing a stationary state for centuries, in which its own temporal dimension is not acting in a linear way in practically nothing. It is incredible that such a crucial sector, in a country like ours, is not updated or fostered as an institution, application and operation. It is also clear that it is not possible to analyze this issue without the political and economical artifacts underpinning the induced maintenance of such *status quo* we still face today; and in not having significant goals and interest towards a fair and balanced development in Brazil, it is in the Education (or in the lack of it) where we can assure having an **ignorant** country.

I reinforce the criticism to people’s ignorance, taking as premise a society with “fake” access to information, but not the lack of access to such available information. Confusing? Let me clear that out.

If for some communication theories, information is not delivered with attached meaning, which is a fact, at least in a *Habermasian* line¹, the mere fact of having it in quantity, and with no knowledge, leads to the banalization of the information itself, for both those delivering it and those possessing it. It is like having access to a number of “things” we do not know what they are for or what their boundaries are. I very much appreciate neuroscientific perspectives², for they offer an important cognitive base to understand that “signs” or “meanings” are generated from learning and interacting with the whole.

¹ Habermas, Jürgen. Theory of Communicative Action. Source: Paidéia (Ribeirão Preto) By José Marcelino de Rezende Pinto. In http://www.scielo.br/scielo.php?script=sci_arttext&pid=S0103-863X1995000100007

² Pinker, Steven. How the mind works. [s.l.]: São Paulo, Cia das Letras, 2000

And within this scenario of *knowledge*, memories, cultures, perceptions, logic (among many other artifacts) are the grounds for decision making based on the thought. So, when information is delivered in all ways and quantities, having their appeal turned simply to consumption, we find ourselves in a type of “virtual floating or looping”, leading us nowhere in “knowledge”, thus carrying us to the mechanical “simply consuming”.

Our brain is a complex box that cannot be formed by a simple explanation, even about the mind. That way, **with no focus or intention**, we have boundaries (despite billions of existing neurons) to synaptic controls making us to think, or intertwine connections to develop intelligence, learning, findings and any similarity we wish. It is fundamental to take control of our brains!

Let us take as a simple example the service sector, such as telephone companies, internet, airlines, banks or credit card companies; among others... what do they have in common? – They promise a number of benefits for our “*customer fidelization*” in order to conquer their space in a world where competition relies no longer in the product itself or its presentation, but in the benefit the user gets with that provider; nevertheless, they will advertise their products along with the “bonus” but will not comply with them, besides that they will create internal and simply illegal rules regarding consumer rights or overacting ethics. We, on the other hand, only find that out when we are already inside a problem or an arbitrariness coming from one of these businesses. At times of great events like the ones Brazil is about to experience, in the World Soccer Cup and the Olympic Games, we can already see abuses from the airline companies, which nowadays practically determine *what is or what is not legal* in Brazil, regarding consumer rights. Be aware that if you buy a ticket and try to change the date of your flight, besides paying a fine (arbitrary), there are tickets (according to the company’s rules, **which nobody knows about**) that cannot be altered or canceled; as if it was possible for a customer not being able to have the right to cancel a purchase.

Why do such things happen? Because we almost don’t have time to analyze all information surrounding us. Not to mention, obviously, bad faith. We either analyze all data, losing our precious life time, or we do not consume within the time pre-determined by the WHOLE (which we take in) and take the risk of not being duly included in this society, being it more disposable than lasting. What is the way out after all? In having all sorts of information shall we analyze them all? Or would we be better off avoiding consumption? Is it such a binary choice or is there a way to establish filters for both consumption and information?

I particularly stand in with the third choice, as being an *Edgar Morin*³ follower and a SKANK fan⁴, life is much more complex than binary possibilities and there will always be more than only two sides.

³ Morin, Edgar. *Complex Thinking*. Porto Alegre: Sulina, 1991. *Method 4. Ideas*. Porto Alegre: Sulina, 2002. *Method 3. Knowing knowledge*. Porto Alegre: Sulina, 2005

⁴ SKANK. Quote on the Brazilian Rock Band

Before such fatal but also vital complexity for the autonomy, and therefore, life choices, is that I will always stand for a nation's Education, as its biggest trump.

Brazilian Education: Rankings and e Population Rates

Analyzing Brazil's trump in the latest ranking of the Programme for International Student Assessment (PISA 2013-2014)⁵, in math, for instance, we are only behind Latin countries like Chile, Mexico, Uruguay and Costa Rica, but ahead of Argentina, Colombia and Peru. Tunisia, Jordan, Qatar and Indonesia are other countries behind Brazil's performance. But what is really interesting in this issue is the duality of the political analysis of the presented data, with the conclusion floating between "a significant improvement when comparing to the latest 10 years' results (...), at the same time being ranked 58th among 65 countries analyzed. It is an alarming distortion. In an analogy with soccer, it is like enjoying "loosing", as long as it is not for Argentina (?)"

Can we continue assessing Education with the latest years' or centuries' eyes? We do not hold the *chronos* or Cartesian time to solve such a high level problem as a folk's Education. Not knowing math does not merely mean not having education, when seen in a ranking, but it means not knowing how to compute, in other words, is lacking the development of high impact cognitive skills, for "thinking". Our children and youth are not only out of classrooms, but also heading towards a defective rationality, which is even worse. Today's time is more a quantum dimension than a relative one; it is a probabilistic dimension with trends, interconnected variables we are immersed in, leaving us no merely linear options. A society who "does not compute, does not know how to think"⁶.

Other relevant indicators for discussing Education in Brazil are the illiteracy rates and functional illiteracy. In this network society we live in the functional illiteracy is even more dangerous than the illiteracy itself, for a large part of exaggerated consumers or consumers with no knowledge on what they are consuming are part of this group. In 2013 IBGE (Brazilian Institute of Geography and Statistics) presented this scenario, a country with a functional illiteracy rate⁷ of 18, 3% of the population (in a sample with people over 15 years old and less 4 years of completed studies), comprising 27.8 million people in 2012; quite a lot of people.

IBGE also states that, since 1998 the illiteracy rate hasn't been so high (*those who don't read don't write*), as it happened in 2012. Around 13.2 people were considered illiterate, corresponding to 8.7% of the 15 year old or older population. (...) "In 2011, there were 12.9 million illiterate, corresponding to 8.6% of the total" In addition, IBGE's assertion: (...)

⁵ PISA 2013: Source <http://educacao.uol.com.br/noticias/2013/12/03/pisa-desempenho-do-brasil-piora-em-leitura-e-empaca-em-ciencias.htm>

⁶ Pinker, Steven. The blank slate. [s.l.]: São Paulo, Cia das Letras, 2004. The language instinct. São Paulo: Martins Fontes, 2002.

⁷ Functional illiteracy (the proportion of 15-year-old people or older with less than 4 years of accomplished studies upon the total of the population in the same range) in Brazil: data from IBGE extracted from <http://noticias.terra.com.br/educacao/ibge-analfabetismo-cresce-pela-primeira-vez-desde-1998,e5e1e55448c51410VgnVCM3000009acceb0aRCRD.html>

Illiteracy is mainly perceived amongst the older population. Among the 60 years old or older more than 24.4% do not know how to read or write. As for the age group 40 to 59 years old, the proportion is 9.8% from the total; between 30 and 39 years old 5.1% are illiterate; and between 25 to 29 years old, 2.8% are illiterate. We have practically a “Senegal” or a “Zambia” of illiterate people, isn’t it substantial? And taking into consideration the increasingly longevity, this must be considered worrying.

All types of illiteracy and society of technology and waste ruling us (...) a huge challenge for quality Education. And although Castells⁸ is already revealing the arousal of a new network society, less capitalist and more willing to share, “the current time” we are living in and which will be “the past” later on has to be changed, immediately.

On the contrary, we remain in the paradox “Consuming X Thinking”, because we still need to replace our cell phones with the latest upgrade from the industry, at the same way it is (still) necessary to join social or communication networks as soon as they become obsolete “even though the existing one still works fine”, because competition needs to win; and everything happening within a couple of month’s time. On the other hand, we will keep conceiving (and waiting for) the country’s educational development “for long years”. For our luck (or not) we do not need additional measures such as “wars” or “revolutions”, or even “*hunger games*”⁹, making a quick analogy to the cinema series which resembles the behavior in the past, to echo the changes needed.

The phenomenology of a no longer Cartesian velocity

The consumption/disposable society is the same one of the indebtedness and ignorance (from the beginning of this chapter); it is easily Platonized by the phenomenology of the Cavern Metaphor, where an ignorant world lives in the cave, accompanied by shadows, but adorns it with luxury brands; so, if before we had a great part of the population with no access to information, and therefore with no right of consumption, today we have the same population with access to consumption, and Homeric limits in the credit cards, but indebted in the long term, because they are not “aware” of the information they have.

Changes in a country’s core segments such as Education and Health, for instance, need intention and assignment of a GDP to be in fact applied, for the same previously agreed intentionality, and democratically disclosed, for the real development of the nation, duly measurable by indicators recognized and accepted by the population. Politics will and less verbal and acting corruption may also solve this issue.

For and in Education we have no chronological waiting time or with any other related allegory; I do not mean to adorn it; for accepting a chronological time for a solution in

⁸ Castells, Manuel: Reference source: The End of Millenium. Authors: Manuel Castells, Alexandra Figueiredo, Rita Espanha, José Manuel Paquete de Oliveira, Gustavo Leitão Cardoso. Fundação Calouste Gulbenkian, 2003

⁹ Hunger Games: American film series, based on the American writer Suzanne Collins’ books. Source: Wikipedia in [http://pt.wikipedia.org/wiki/Jogos_Vorazes_\(s%C3%A9rie_de_filmes\)](http://pt.wikipedia.org/wiki/Jogos_Vorazes_(s%C3%A9rie_de_filmes))

Education, being coherent with the Physics concepts, means also accepting the continental distance within Brazil. In a virtualized world such as ours, with the remote possibility and access, along with the mobility we hold for information, and therefore towards knowledge, distances are no longer constraints, but only subtle borders to be trespassed.

The online connected Distance Education modality, is already out there, having been conceptualized, decreed (despite being for only two segments, the professional and higher education), at the same time being neglected by the unbelieving parallelisms with face-to-face education, for a great deal of the population able to use it, and extremely bureaucratic due to their faults.

Let us leave DL for a little ahead and start by Higher Education in a generic way.

Higher Education and its KNOTS

Higher Education in Brazil has a bigger worsening than in most of the countries. There is a typological segmentation of *faculty*, *university centre* and *university*, as well as a typification according to the foment, being either Federal, state, and all kind of private, like the philanthropy (which do not want to be considered private), community and the “real” private ones, assuming being for profit.

In such a parallel universe of offers, how is it possible to legislate in an egalitarian way? Or should they rather be distinguished by type? Or, how to demonstrate efficiency to prospect (future student), foreseeing so many differences? Those are not exactly my issues, but they are pervading this segment’s existence. We start by making complex what could be extremely simple. Public Universities (with government foment) and private Universities (with no foment), therefore having different regulations.

Such complexity is present because, again, the “means” becomes the end. And in this case we are not referring to technology itself, but the endless bureaucracy losing within itself, ending up not helping the issue, but becoming “the issue itself”. A good metaphor is the intention of a “knot”, as a “hawser or lace”. Very used in Navy for either rescue or anchorage, the *Lais de Guia*¹⁰ has the function of a lace that does not run free, even with no pressure being applied, but that can also be easily untied, when wanted. Its purpose is to “tie something up” whereas making it easy to be release upon needed; it is what bureaucracy should bear in mind and become.

¹⁰ Lais de Guia: Guide for knot making. In http://www.guiadenos.com.br/nos_view.asp?id=%7BB5C6828E-86BD-4A02-8945-ED31644F9251%7D



Figure 1. Lais de Guia: Guide for knot making

The Brazilian University nowadays is no longer “the academy” which has given its philosophical origin, at the same time it is not able to update itself, conceptually speaking, before such a plural and diversified society, being still kept as the greatest Higher Education entity.

The “knot” is not only conceptual, but it also concentrates the operation that balances between the regulation, the market and the sustainability.

In a quick hindsight throughout recorded History, one of the first universities was born in Asia, the Nalanda University (Bihar, India), being in the II century home for the Buddhist philosopher Nagarjuna. As for the European Universities, appeared in the Middle Age, they arouse during the Renaissance. Free from the religious schools, students and professors founded the University of Bologna¹¹ in Italy (in the year 1088), being a true paradigm against the more democratic concept of future Universities, for it was the outcome of no royal deed or pontiff, common to the creation of universities at the time. Under a little different perspective, in the century XII the University of Paris was created from the prestige of two French Schools of Theology and Philosophy, respectively in Notre Dame and the other in the cloister of the Abbey of Saint Genevieve.

Those Universities were the pioneers of the worldwide academic tradition we recognize in Higher Education. The idea “Academy”¹² was established by Plato in 387 B.C., at his Academy in the woods, near Athens. Its aim was to “learn” philosophy, mathematics and gymnastic. In an analogy (also from Greece) – *mens sana in corpore sano*, the duet between philosophy and mathematics leave no doubt about rationality, and therefore thinking.

Although modernity has caused knowledge to be specialized, it has also deepened knowledge, and today’s cathedras, schools or colleges have expanded scenarios, having broadened Plato’s Academy. However, the formal or classis basis from early forms always echoes.

¹¹ Creation of the firsts Universities: Source of query: Lisbon’s General Study – Casa de Sarmiento – Universidade do Minho (Portugal): Queried in http://www.csarmiento.uminho.pt/docs/amap/bth/bth1989_03.pdf

¹² About Academy: Plato’s concept of Academos in the text University. From Wikipedia <http://pt.wikipedia.org/wiki/Universidade>

An opening University, but not and OPENED one

In the latest years, precisely in the latest 8 years, we have been hearing business jargons like IPO (Initial Public Offering)¹³, business going public or mergers and acquisitions, in the Higher Education sector. Universities like *Estácio*, *Anhanguera*, *Laureate* and *Devry* Grups spring stars in a competitive capital market, previously only present in the private business world, but not in the educational sector.

Within this new scenario, the idea of a purely Academic University does not sustain the concept of University anymore. However, every University must be academic, for its philosophical origin there is the objective of building knowledge.

The biggest challenge under this profitability perspective for Higher Education in Brazil is the binomial Academy X Operation, drawing the market's attention to the possibilities this new economy can bring the Country.

Here is an extract of an Edition of the International Business Times¹⁴ – *IBTimes* in July/2013 with the title: For Brazil, What's The Right Higher Education Equation?

*(...) **For-Profit Higher Education:** A further phenomenon in this sector, though not wholly uncontroversial, has been the recent rise of the for-profit sector as a response to the pent-up demand for access to higher education. Following the passage of legislation by the Brazilian government in the mid-1990s, which aimed to open up higher education, the for-profit sector has grown substantially and filled the gap in terms of access to higher education. Kroton Internacional, a for-profit educational group, just announced in April 2013 that it will merge with Anhanguera, a rival company, which would create the largest educational group in the world with over one million students. The next largest educational group is Estacio University with over 350,000 students. Other groups, including DeVry, have also entered the sector. This growing segment of the higher education market has offered Brazilians additional alternatives to public and not-for-profit private universities. Another area that is set to develop further is online learning, which still faces hurdles, including the slow process of gaining official sanctioning for new distance learning course offerings, and the challenge of building institutional capacity for better delivery of technology-based courses. However, given the sheer size of Brazil, expanding online learning will prove to be critical to the Brazilian government's education strategy as it seeks to increase access to higher education. Dr. Susane Garrido, President of Estacio University's campus in Porto Alegre, and member of the Ministry of Education's academic*

¹³ IPO (Initial Public Offering): Public offering of shares is the act of granting any person the opportunity of acquiring company's shares. Beto Veiga's Blog <http://www.betoveiga.com/log/index.php/2007/10/o-que-ipo/>

¹⁴ IBTimes – Article by David Felsen – Saint Leo University (Florida). Queried in <http://www.ibtimes.com/brazil-whats-right-higher-education-equation-1351047>

commission on distance learning, argues that distance learning is vital to Brazil's future and must be encouraged by government. She notes that, "Without expanding distance education you cannot move higher education forward. ... It needs to be allowed to develop freely." – David Felsen (author).

In a macro sphere, that binomial empowers economy as the science leading Higher Education moves in Brazil, taking into account that such "market" represents around 88% of national vacancies, therefore the access possibilities for a great deal of the working population in need of studying in a single shift or in the distance learning modality.

Private universities, by excellence, are the ones having (and in need of proving) their financial sustainability without government's foment, diverging from the Public ones having it. In this sense, and in an increasingly competitive scenario (with a suppressed demand though) remaining in the "game" and proving quality through assessment indicators from the official instrument established by MEC (Ministry of Education) forces the institutions to reinvent their concepts, creating different offers like DL; varied financing options for students; nationalization and internationalization projects, as distances become virtual; as well as mergers and acquisitions, all are now part of the inclusion or growing strategies, as long as it is not referring to organic growth.

The of Acquisitions and Mergers

The role of an Institution acquiring another is extremely more complex than the management *in natura* of an Institution with organic maintenance and/or growth, for several intrinsic aspects such as culture, punctual administrative/financial processes, syllabus, faculty, as well as the extrinsic ones such as "brand", "quality awareness", "surprise factor", among others, tent to an exponential reverberation (almost always negative at first) due to lack of knowledge of the new concept, as well as the new *modus operandi*.

Establishing clear parameters with controllable impacting gray areas (at least) within an operation, both in the integration and "changing" phases are difficult tasks, requiring management to have administration skills, University knowledge (academic), power for innovation (for there is much more movement than stillness in this field nowadays), as well as an excellent picture of the general context to be able to deal with people, lecturing faculty, students, staff, investors, prospects and other communities currently involved in the university community.

Under another perspective, these institutions' acquiring or merging capacity also usually express their ability of recovering others, bringing about a third option within a scenario showing only two in the past. Either it was federalization or auction, with institutions having not only their financial assets but also thousands of students left unassisted.

This way, in the attempt of recovering a Higher Education Institution, under the academic point of view, considerably improves the capacity of assessing knowledge. The institutional assessment, as a common sense, maybe seen as a bare indicator for MEC, now becomes a

crucial element of understanding the institution's internal dimensions, which can be currently blurred, being translated as inefficient class plans or poor facilities, whereas in a private HEI it can be seen in the default or students' evasion. How is it possible to know what happens without measuring or controlling? What to do? Who should do it?

Along our educational history, although being quite behaviourist (unfortunately), we become 'experts' in such controls, but is that worth by itself? – By itself it isn't, what is truly a relevant factor is creating a culture of co responsibility and co working together with the WHOLE academic (social) community.

Despite these implications or waivers, big Groups in healthy financial conditions, including Estácio, have the *input* of such acquisitions in their DNA, being also a possibility of growth for such private Education Institution. However, such processes also show a way of being co responsible for the recovering and improvement (both financial and academic) of HEI, representing 88% of the offers in the Brazilian higher Education sector¹⁵, being only 12% public.

That way, every deficient financial, academic or even innovative operation strike on no less than 73% of the total number of students in the country, representing 5 million students with problems (considering the total number of university students being 7 million), not to mention those who have STILL not embraced Higher Education.

Regarding the 'repressed demand', the Government is also doing its part by creating the BOU (Brazilian Open University) in order to assure mainly Teaching Certificates and technology related courses. A number of 63 federal universities are expected to join the BOU Program in the year 2014, according to MEC¹⁶.

But without private institutions' strength and capacity, in terms of mergers and acquisitions, Brazilian higher Education will strive to overcome the current 9% of teenagers "inside"; because we are living in the Era ruled by the speed of information and technical knowledge, without that partnership Brazil is doomed to stall.

Regulation and Assessment of Brazilian Higher Education

Being a private institution has its advantages. The management overview, in all instances, is broadened in an almost *Gulliverian* way, since there is no financial income other than from the institution's revenues, coming from satisfied students willing to rely on a well ranked Institution.

¹⁵ Private Universities in Brazil: Sourced from Santander Universia

<http://noticias.universia.com.br/destaque/noticia/2003/10/20/528832/mec-88-das-universidades-so-particulares.html>

¹⁶ Portal Mec Gov Brasil: Queried in

http://portal.mec.gov.br/index.php?option=com_content&view=article&id=12265:uab-universidade-aberta-do-brasil&catid=248:uab-universidade-aberta-dobrasil&Itemid=510

Besides being efficient and effective, an institution of that nature has to be responsible, innovative and surprising in order not to struggle. The quote has no intention to be marketer, but could be translated as: “Try using SINAES Cycle well”. By using it (with a certain effort), in 2013 Estácio presented an outcome better than in 2012, in all its institutions (including the acquired ones), representing 34% of IGC grades (General Courses Index). 14 from the Higher Education Institutions in the Group had growth, thus increasing the Institution’s CI (Institutions’ continuous grade), meaning that 29 of them had a growth of around 70.7%.

For a better understanding of our Higher Education Assessment parameters, I am exemplifying part of INEP’s assessment strategy, with the intention to show that the Assessment cannot be the “finish line”, but it has to be “the process”. We know how the game works, that the university has to operate like one, as well as we are aware of the Indicators we are assessed by. Under this perspective, and striving for quality and sustainability the operation shall happen.

Under the consent of MEC, SINAES (National System of Higher Education Assessment)¹⁷ an assessment cycle is defined as (...) ‘comprehending a periodic assessment of higher education institutions, based on quarterly students’ performances, supporting, respectively, the credentialing and recycling of knowledge. Art. 33. Directive n. 40/2007, reissued on December 29, 2010. (NR)”.

Within this Cycle, processes like ENADE (National Exam for the Assessment of Student Performance)¹⁸, with parameters/concepts obtained from the results from the exam applied to students is one of the indicators of Brazilian Higher Education, enabling the student to both contribute to and “assess” the institutional process claimed by them. It is an Institutional role to inform and assess our own improvement, fostering an ENADE culture, not being limited to the STUDENT’S SCORE or INSTITUTION’S SCORE; it represents the student’s perception about his own learning.

¹⁷ SINAES Cycle. Source INEP: Presented by Cláudia Griboski in

http://www.google.com.br/url?sa=t&rct=j&q=&esrc=s&source=web&cd=1&cad=rja&ved=0CCwQFjAA&url=http%3A%2F%2Fportal.mec.gov.br%2Findex.php%3Foption%3Dcom_docman%26task%3Ddoc_download%26gid%3D9744%26Itemid&ei=w0fZU5j9N5GNkAfjpoGwCQ&usq=AFQjCNEYNWOYMNwimHN_uSrbhD39HtDhJg&sig2=h4c6ozjeOqCo1-x-8QsR3A

¹⁸ ENADE: Exame Nacional de Estudantes (National Exam for the Assessment of Student Performance) carried out by INEP, according to the guidelines established by the National Committee for Higher Education Assessment (Comissão Nacional de Avaliação da Educação Superior) – CONAES, a coordination and supervision department of SINAES – National System of Higher Education Assessment. Sources: INEP website, accessed through

http://portal.inep.gov.br/c/journal/view_article_content?groupId=10157&articleId=115771&version=1.2 and data from the National Forum of Higher Education (Fórum Nacional de Educação) from Unicamp which took place in 2013, through: <http://www.fe.unicamp.br/anfope/menu2/links/arquivos/EducacaoBrasileira-Indicadores-versao23-04-13.pdf>

In the same way the CPC – Preliminary Concept of Courses¹⁹ is also a systemic indicator, being formed by the combination of CC (Course General Score) and ENADE results, being simply assessment, for it encloses from perceiving quality through the academic community to the satisfaction of all those involved in both intrinsic and extrinsic ways, because we compare results with other institutions that generate data for IGC (General Index of the Institutions Courses – from 0 to 500 points). The IGC also represents how much an IES is coherent and uniform in its quality as a whole, from graduation to post graduation (*stricto*), measured by CAPES.

Turning a private Higher Education Institution in Brazil profitable (for longstanding), with the minimum expected quality indicators, and at the same time meeting students' (and prospects') demands is quite an ambitious task, even for those already successful institutions. One's background nowadays is still attracting, but keeping in relies on feasible adaptability and innovation within an ever changing scenario.

Distance Education

Distance Education (or virtualized education)²⁰, in a common sense being a “bastard” sister of the face-to-face Education, is an innovation, but only if it carries along technological needs and possibilities, and students. Under this view, when thinking in medium or long terms, the models separating the two of them is not innovative, but it simply solves a short term problem, forgetting that sustainability is no longer portrayed that way.

Blended or combined models; or the dissemination of self customized offers (under the learning objects view as not mere objects) are an imminent reality we have to think about now. They also need to be aligned with the Rules and the Assessment, **because when we brake paradigms** from hampered syllabus, in which, still today, we cannot draw according to student's interests regarding modalities, we will keep having simple courses, training activities, programs, subjects or whatever we may call them, **either face to face or virtual ones**.

Those possibilities allow us to broaden Higher Education beyond the University physical walls, attracting internationalization movements for courses endorsed by all associated universities willing to have them. When reaching this level we can have hope on an international accreditation or double accreditation (more than one university accrediting a graduation course). We can take as an example the Bologna Agreement²¹ which unified Europe through mobility. Brazilian Universities have to be prepared for that.

¹⁹ CC and CPC: Indicators/grades from SINAES, respectively representing Course and Course plus ENADE. Source: INEP website, accessed through <http://portal.inep.gov.br>

²⁰ DE: Accessed through the link of the Census EaDBr from ABED: Queried through: http://www.abed.org.br/censoead/censoEAD.BR_2012_pt.pdf

²¹ Bologna Protocol: Source: Ministry of Science, Technology and Higher Education from Portugal, accessed through <http://www.dges.mctes.pt/DGES/pt/Estudantes/Processo+de+Bolonha/Processo+de+Bolonha/> International accreditation: In the Work of Fredric Litto and Marcos Formiga (organizers). DE: Distance Education: the State of Art. ABED Ed. Chapter: International Organizations and DE (GARRIDO, Susane M. L.; Paraskevi Bessa Rodrigues): 2012

The *online* fever, being the web linked through satellite, internet or any other mobile or stationary device, is an exclusive virtual, timeless, non-territorial phenomenon. Breaking time barriers and Cartesian space limits broadens everything to be reached. It has to be conceived, regulated and operated with such perception not to become a Frankenstein constituted with parts from everything, at the same time not triggering or modifying anything, because it has not been established through a necessity or innovation. DE cannot be faced as a fad, for that way it wouldn't try on which models work (or not) for every Institution in particular, with customized aspects according to the current culture, with the efficiency impacting technology, people, beliefs, skills, and above all, the grounds and suitable instruments for the development of each knowledge are they are suppose to interact with.

Objectively understanding DE as a possible Education path, facilitating a great part of the population, who otherwise wouldn't, to enrol in Higher Education studies, should guide the choice of a University, due to a complex arsenal involving virtualized Education (different from the face-to-face one), with different models, specialized trainings, resources, as well as targeting where and how one wants to reach, and mainly, from people who are engaged on a very peculiar academic and administrative culture, working with autonomy after being installed.

I believe we are very close to the University of the future, one that does not abandon its conceptual beliefs from the past, but one that learns how to reinvent itself to always ECHO the public it is indeed serving.

E-STEP – SUPPORTING TEACHERS’ AND PARENTS’ PARTNERSHIPS SOCIAL-NETWORKING TECHNOLOGIES

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Abstract

The E-STEP Project (www.estep-project.eu) supports the collaboration of schools and parents through social-networking technologies. Teachers and school managers skills to collaborate with pupils parents have been identified as one of the priorities that EU Member States should promote both in initial teacher training, as well as in teachers ongoing professional support, in order to achieve high quality of teaching. Schools are viewed as learning communities, where pupils, parents and teachers commit to a common vision about the values and objectives of schooling. Effective school leadership is also associated with building active partnerships with parents so as to foster higher achievement levels as well as to support pupils overall cognitive and social development.

The final outcome of the project is a specialized training framework and supportive materials for teachers around Europe on:

- How to support, engage and motivate parents to utilize social networking systems in order to collaborate with teachers.
- Developing strategies and initiatives that teachers and school managers could use to communicate effectively with parents and to engage them in support of their children’s learning at home and at school.
- Specific approaches for school leaders on how to support their school teachers on designing and effectively implementing parental engagements activities.

Introduction

Teachers’ and school managers’ skills to collaborate with pupils’ parents have been identified as one of the priorities that EU Member States should promote both in initial teacher training, as well as in teacher’s ongoing professional support, in order to achieve high quality of teaching¹. Since 2000, parental participation has been identified by the EU Ministries Working Committee as one of the 16 quality indicators of school education² and schools are viewed as ‘learning communities’, where pupils, parents and teachers commit to a common vision about the values and objectives of schooling³. Effective school leadership is also associated with building active partnerships with parents so as to foster higher achievement levels⁴ as well as to support pupils’ overall cognitive and social development.

The project E-STEP is a transnational cooperative European project funded by the Comenius program (539498-LLP-1-2013-1-GR-COMENIUS-CMP) to help teachers and school managers acquire and reinforce such attitudes, skills, knowledge and qualifications that will enable to effectively engage parents in schools and interact with them through social networking technologies. The project consortium consist of several high quality organisations like universities, Federal Ministries, international companies and national associations dealing with ICT in teaching and learning. More particularly, three of the partners represent Ministries of Education (CTI/EL, BMBF/AT, NRN/BG), while the entire consortium demonstrates extensive practical engagement with the school sector. All partners have long experience in working with European and national school networks and teacher training programmes e.g. the Open Discovery Space pan-European school community (CTI/EL, EA/EL, NRN/BG, ULS/IE), eLSA schools (BMBF/AT), Digital Schools (ULS/IE), universities (BCU/UK) and ‘Rural Wings’ European Schools’ Network (EA/EL) and the Greek Network for School Innovation (EA/EL). The European Union supports the E-STEP project within the Lifelong Learning Programme (LLP).

Parental Engagement

Parental engagement is a powerful lever for improving pupils’ cognitive and social development, as well as their learning outcomes (Howland et al., 2006). Despite the varying perceptions, types and degrees of parental involvement, there is consensus that it is associated

¹ Conclusions of the Council and of the Representatives of the Governments of the EU Member States, meeting within the Council of 15 November 2007, on improving the quality of teacher training- Official Journal of the European Union, 12.12.2007, <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:C:2007:300:0006:0009:EN:PDF>.

² The quality of School Education – Sixteen quality indicators, Report based on the work of the Working Committee on Quality Indicators, May 2000, http://eacea.ec.europa.eu/education/eurydice/documents/key_data_series/134en.pdf

³ COMMUNICATION FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT, THE COUNCIL, THE EUROPEAN ECONOMIC AND SOCIAL COMMITTEE AND THE COMMITTEE OF THE REGIONS Tackling early school leaving: A key contribution to the Europe 2020 Agenda, http://ec.europa.eu/education/school-education/doc/earlycom_en.pdf

⁴ Council conclusions of 26 November 2009 on the professional development of teachers and school leaders – Official Journal of the European Union, 12.12.2009 <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:C:2009:302:0006:0009:EN:PDF>

with a range of positive indicators, including attainment (from early childhood until adolescence and even adulthood) (DCSF, 2008), school dropout reduction and fewer behaviour problems (Stevenson & Baker, 1987). Partnerships between schools and families can also enhance social integration, i.e. for children with migrant backgrounds⁵. It is important, thus, that schools create an inviting climate and maintain parents’ involvement (Epstein & Dauber, 1991). Teachers, as key-agents, will need to develop positive attitudes and particular skills in order to invite, motivate, support parents and collaborate with them and to deal with the barriers. This can be particularly challenging (Honfield et al., 2009), as most University and other training courses do not prepare teachers for engaging parents in a thorough and systematic way. Moreover, initiatives such as the EPA-parents⁶ focus on parents’ involvement in educational policies around Europe, but do not provide training for teachers.

Schools in reality also face certain barriers in engaging parents, i.e. organization issues, such as big numbers of students and teachers (especially in Secondary Education, where each child is taught by various teachers). They also have to deal with practical issues, e.g. social and economic factors, language barriers, child care commitments and practical skills such as literacy and parents’ ability to understand and negotiate the school system (Harris & Goodall, 2007). Studies suggest that in order to make a sustainable difference and to optimize the positive impact of parental engagement – among others – there has to be strategic planning, sustained support, training and resourcing, as well as a supportive networked system that promotes sharing of experiences, development and assessment (ibid.).

In view of these barriers, Information and Communication Technologies (ICT) and tools can serve as important means to support teachers’ and parents’ collaboration. State-of-the-art ICT networking tools and platforms have the potential to enable individuals to enhance their social networking and, thus, to enhance their learning (Garofalakis et al., 2010). For example, evidence from the EPRA project in the UK showed that the use of web based reporting tools that were provided through schools’ portals to connect schools and parents, improved students’ attendance (Harris & Goodall, 2007). Web tools are also employed by individual schools in order to create partnerships among teachers, parents and students (i.e. August Senoa Elementary School in Zagreb⁷). Such initiatives are, however, sporadic and the potentials of new technologies have not yet been fully explored, understood and exploited. Also an additional need that emerges is that teachers should be trained in order to use such tools and lead a change in schools’ and families’ interactions.

Based on these considerations, E-STEP project sets out to enforce teachers’ and school managers’ awareness, motivation, knowledge and skills that will enable them to strengthen parents’ roles in schooling. This is planned to be implemented by utilising state-of-the-art ICT

⁵ European Commission “Integrating Immigrant Children into Schools in Europe- Measures to foster 1) Communication with immigrant families, 2) Heritage language teaching for immigrant children”, April 2009, Source: Eurydice, http://eacea.ec.europa.eu/education/eurydice/documents/thematic_reports/101EN.pdf

⁶ European Parents Association <http://www.epa-parents.eu/News/Newsflash/ParentsPivotInLifelongLearning.aspx>

⁷ <http://www.elearningeuropa.info/en/article/Website-%E2%80%93-A-Partnership-between-Parents%2C-Students-and-Schools>

networking tools (Garofalakis et al., 2010). Teachers and parents will benefit from such technologies by getting the means for connecting themselves to education services, resources and collaborative learning support opportunities. An example of such technologies that will be used to this end is the recently launched European collaborative and multilingual open learning infrastructure designed to boost demand for Europe-wide eLearning resources (www.opendiscoveryspace.eu) – funded by the EC ICT/PSP programme. Such tools will provide online facilities for

- networking among schools, teachers and parents,
- training for teachers in order to
 - acquire the necessary skills for effective collaboration and engagement of parents,
 - ICT digital skills in order to use social networking tools efficiently in order to engage parents,
- access to digital resources that will help teachers and parents to collaborate effectively.

The training framework will be sustained in the future through the use of an online training process along with toolkits and guidelines for school staff. This process will enable teachers to be familiarized with the empirical knowledge about parents’ engagement, and to directly apply this knowledge base in real-life situations in selected pilot schools around Europe.

The pedagogical framework

The main result of E-STEP project is the training framework curriculum in order to achieve the benefits of parental engagement in schooling. The design of the training framework was implemented along the guidelines for teachers, school managers and school ICT staff on how to collaborate effectively with parents through social networking technologies. The training framework (Kendall, Kanira & Taylor, 2014) enables trainees to:

- **explore** key issues and debates in parental engagement
- **engage** with the wider school community to better understand parental engagement and the existing and potential roles of social media in their own context
- **create** new meanings, identities and roles in relation to parental engagement
- **experiment** with social media as a tool to support effective parental engagement
- **collaborate** with parents, teachers and the wider school community
- **drive** innovation and implement change

The framework design is underpinned by an enquiry-based approach, participatory action research (PAR), that encourages inclusive, collaborative and co-constructionist approaches to institutional growth and development. PAR is process orientated and starts with reflexive engagement with the everyday experiences of participants in the school/college community enabling trainees to develop, in collaboration with others, grounded descriptions of how parental engagement ‘currently works’ in their particular context. This then allows the community to ‘work towards change’, the next stage of the PAR process, that is distinctive, highly differentiated and tailored very particularly to the needs and aspirations of the institution and the community it serves.

This generative approach, where course participants are most often in production rather than consumption mode, will ensure that the framework generates outcomes that meet the needs of a broad spectrum of institutions and promotes trainee learning that is responsive to the diverse student, parent and community groups that schools and colleges work with. As such it is ‘future-proof’, sustainable and highly relevant to a wide range of institutions across Europe that is concerned with young people’s learning.

Throughout their learning participants will explore social media in two ways; as a context for stimulating and sharing their own thinking, learning and collaboration; and as potential tools to support and facilitate new ways of working and interacting with parents. As such they will be immersed in an experiential learning programme through which they will learn about the potential of social media through ‘real-life’ engagement and participation in a learning context.

The framework comprises three modules that, taken together, train participants to work competently and confidently with the PAR learning cycle, each module representing a stage in the classic PAR process: documenting and contextualising the current situation; working towards change; and understanding impact, affect and influence.

Module one, ‘**Understanding Parental Engagement in Context**’, will introduce action research methodologies, modes and strategies and open up exploration of key concepts and definitions. Participants will be encouraged to experiment with social media (mainly using communities on the ODS platform) and engage in reflexive evaluation of existing practice, cultures, attitudes and values. These will include collection of pre-existing empirical material as well as generation of new data through implementation of more creative, experimental approaches such as story-telling and artefact production. A range of conceptual lenses will then be used to critique, analyse and make sense of this material so as to establish starting points for working towards change.

Module two, ‘**Working towards change: planning and implementing context specific parental engagement**’, will facilitate a series of interventions derived directly from the close examination of the school/college context undertaken in module one. Participants will agree strategic priorities for their own institution alongside a bespoke, context specific, ‘road map’ for change that will identify the key actions and dependencies (resources, roles, responsibilities, training needs) that will be required to realise the aspirations articulated in module one.

Module three, ‘**Parental Engagement in practice: understanding outcomes, impact and influence**’, will explore a range of strategies for documenting, describing and evaluating the outcomes of parental engagement in practice. It will support design, development and implementation of robust and rigorous evaluation tools that draw on a range of qualitative and quantitative traditions. This will enable institutions and communities to understand the outcomes, impact and influence of their parental engagement work through a range of lenses and to pay attention to anticipated, as well as the contingent and serendipitous, change and or

development. This module will also explore strategies for sustaining momentum and enthusiasm for ongoing collaborative development in this key area of work.

Through participation in the E-STEP programme trainees will develop, extend and practice a range of skills in relation to:

- use of digital and social media;
- communication skills;
- community engagement;
- project management,
- reflective practice;
- enquiry and research;
- project management, planning and target setting;
- data collection;
- team working;
- collaborating with others.

The programme of study will engage participants in the following modes of study:

- face to face, synchronous and asynchronous online activity;
- analysis and synthesis of a range of texts in different formats;
- participation in a range of learning activities including mini-lectures (synchronous, asynchronous or both) and workshops;
- participate in digitally mediated interaction and learning;
- research and data collection;
- discussion and debate with peers;
- discussion and debate with a wider range of stakeholders in the school community including trainees, young people, parents, other teacher and wider representatives of the local community that the school/college serves,
- elicitation and analysis of quantitative and qualitative data.

As an example an introductory video available at the E-STEP community on the ODS platform (<http://portal.opendiscoveryspace.eu/edu-object/e-step-introductory-video-774735>) shows practitioners from UK exploring the use of technology in schools for parental engagement.

Evaluation Results

In order to test the efficiency of the developed training framework, teachers, school managers and ICT school staff/experts who work at schools, involved in a series of training activities in two phases. 25 pilot schools from five European countries (Austria, Bulgaria, Greece, Ireland and UK) have participated to the E-STEP workshops during Phase A and 200 schools are intended to be trained in phase B. The participating schools get trained based on training framework and then implement their action plans engaging parents with the use of ODS or other social networking tools. During the implementation phase of the training framework an evaluation process is undertaken in order to assess the E-STEP effort. Specific evaluation

questionnaires and interviews addressed to teachers and parents have been spread in participating schools. Up to now 44 evaluation questionnaires have been filled teachers who participated in the seminars as trainees. In order to evaluate the developed trainees and trainers guides the pilot schools have been invited to attend the workshops during which the training framework has been introduced. The results of the evaluation questionnaires are used to further improve the training framework (Chelioti et al., 2014; Koskeris & Boufardea, 2014).

The high percentage of positive replies implies clearly that the training framework is innovative and provides useful knowledge to trainees. The trainees rated very highly the educational techniques used. Undoubtedly the implementation plan was very well organized proposing attractive and effective techniques. The main concern of trainees is the willingness of parents to participate in activities promoting parental engagement. This concern reveals one of the main problems of effective parental engagement which is the “parents”. It is the opportunity to try the proposed techniques which will confirm or negate this concern. In many cases teachers informed the organizers of the workshops that they already use Facebook and other social media to communicate with parents.

The teachers seemed rather uncertain about their ability to convince and engage the parents in a way that would not interfere in their teaching. They expected more concrete instructions and detailed support how to develop the school action plan for the implementation of the approach in the specific school settings.

In most workshops the parents were reported as very open to get engaged, but there were differences not only among countries, but also among different school settings within the same country. Some parents were highly involved in all aspects of school life, others only in those academic subject-specific areas where their children were involved.

Conclusions

The project results and outputs are based on different inputs from different individual strengths of all participants (partners, teachers, parents, etc.). The E-STEP researches elicited and mapped the national needs of each partner country. The developed training framework took into consideration all the essential strategies and concepts that found in the respective European countries. From the implementation of the training framework significant findings were emerged about the use of social networking technologies in promotion of the parental engagement.

Overall, despite the general use of ICT it seems that the importance of face-to-face contact was valued by both parents and teachers and there was a mutual stated need for to increase in the frequency of such meetings on a regular basis, including one-to-one sessions in schools where this did not yet happen. There was a general reservation from both sides about the potential of digital tools, to substitute face-to-face contact.

The developed training framework improves the methodological approaches on how teachers can effectively motivate and engage parents and will also target the necessary ICT skills for making effective use of social networking tools for this purpose.

The resulting set of innovative scenarios of interaction and collaboration between teachers/school managers taking place through social networking tools developed in phase A serves as the groundwork for the upcoming phase B which embed schools covering large areas of the partner countries. The training framework will be further improved after the end of the phase B when 225 schools in total will have trained and use its guidelines.

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ILBES: AN INNOVATIVE ICT-ENABLED INTERGENERATIONAL LEARNING APPROACH IMPLEMENTED ACROSS EU

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Abstract

Public libraries, educational, cultural or welfare centres, and other public spaces where digital services are embedded, hereby referred as Blended Environments and Spaces (BES), have become an important provider of free, public access to ICT, the internet and learning environments for socially-disadvantaged target groups. They are a reference point for new technologies, non-formal learning, people empowerment and social integration. The clientele of BES largely include seniors and elders who are digitally illiterate, and youngsters volunteering as adult trainers on the basis of their own digital competences. At the same time, the current economic downturn is pushing the job-inexperienced youngsters to look for help at these and other centres with social vocation due to the reduced employment opportunities they found.

The Intergenerational Learning in Blended Environments and Spaces (ILBES) methodology was developed and is being exploited through a family of *eScouts* projects. It is inspired in two proven learning methodologies (Community-Service Learning and Participatory and Appreciative Action and Reflection) which were combined to design an intergenerational learning circle that facilitates the socio-digital inclusion of seniors and the entrance of youth to the labour market and adult life, while improving solidarity between generations and local community cohesion.

Public Internet Centres as providers of digital competence training and empowerment

Today, we see a big variety of Blended Environments and Spaces (BES) that address social integration mediated by ICT, like public libraries, educational, cultural or welfare centres, co-working spaces, living labs and other public spaces where digital services are embedded. In particular telecentres or public internet centres (PICs) have become an important provider of free, public access to ICT, the internet and learning environments for disadvantaged target groups. Government or NGO-run, they provide free access, training and empowerment. They play a key role in local societies, in towns, small villages and deprived metropolitan areas where they have become a reference point not only for new technologies and non-formal

learning, but also for the development of social cohesion, a sense of community belonging and cultural life (Rissola, 2007; Kluzer & Rissola, 2009).

Telecentres can be categorised by its service provision in the following levels¹:

1. On demand assistance;
2. Training provision of digital literacy training, often with a social orientation;
3. User empowerment (users' digital autonomy and achievement of personal goals facilitated by technological means);
4. Active participation in community (critical use of ICT and engagement of users with their local communities/social belonging groups through their active participation of community/social projects).

The methodology presented in this paper is a tool for Blended Environments and Spaces - like secondary schools or digital literacy providers with a social vocation – to develop Level 3 (empowerment of youths and elders) and 4 (closing the gap between both generations). This is an outcome of a thematic strand of EU-funded projects where an international team of practitioners, researchers and consultants has been developing during a decade, strategies and concrete solutions to increase the capacity of telecentres in their engagement for eInclusion, combining implementation of concrete good practice and development of policy recommendations (see Rissola & Centeno, 2011). From different angles, those projects contribute to the development of telecentres as catalysts of social inclusion by addressing the professionalization of their personnel, training curricula for vulnerable groups, and intergenerational learning cycles promoting civic culture and social cohesion.

ILBES: a methodology for technology-enhanced intergenerational learning

In the projects “eScouts – Intergenerational Learning Circle for Community Service”² and its successor “Trans eScouts – Empowering eFacilitators for Intergenerational Dialogue”³, both funded by the EU Lifelong Learning Programme, the methodology for an intergenerational learning approach between the youth and senior people was developed and implemented. The projects aim is threefold: to facilitate the socio-digital inclusion of senior adults and the joining of youngster to the labour market and adult life, while improving local community life by means of the intergenerational dialogue and mutual support. For this aim, those projects built a learning circle in which the youth supports senior people in ICT usage and, in return, seniors mentor youth in their efforts to access the labour market and to face the challenges of adult life, completing in this way a circle of learning, exchange and conviviality in it, ICT (social web applications) and blended environments and spaces mediate teaching and mentoring processes.

¹ European Vocational Education and Training Solution for e-Facilitators of Social Inclusion (VET4e-I) project. See <http://www.efacilitator.eu/wordpress/vet4e-i-deliverables>

² <http://www.eScouts.eu>

³ <http://www.eScouts2.eu>

These ambitious eScouts projects had to provide a training methodology that supports the learning circle between seniors and youths. For this reason the training design was based on two methodologies which both contributed essential ingredients to an intergenerational and ICT supported learning: the Community Service Learning (CSL) methodology implemented by Fundación Esplai in its “Conecta Joven” network in Spain, and the Participatory and Appreciative Action and Reflection (PAAR) developed by Reflective Learning in the UK. CSL is aimed to maximize the development of the individuals’ potential and their active participation in society by combining learning with community service in a single well-articulated project, where the participants are trained while working on real needs in their community. CSL is, firstly, an activity that starts from the definition of a problem, its study from various angles, the development of proposed solution(s) and finally, implementation and evaluation of proposal(s). Secondly, an activity by association, i.e. made collectively and not as the result of the action of an isolated person. Individual efforts are summed up to carry out civic, participatory and effective projects. Finally, an activity for a social benefit, therefore intended to increase welfare community and in consequence open to solidarity (Puig et al., 2006).

Participatory and Appreciative Action and Reflection (PAAR) was firstly used by Ghaye (2005, 2008, 2010). It describes the development from more conventional forms of action research (AR) and from participatory action research (PAR) to a more explicitly ‘appreciative’ research style. PAAR synthesizes the best practices of action research (AR) and participatory action research (PAR) by adding a third and new dimension called appreciative intelligence. PAAR brings together action and reflection, with the participation of a range of stakeholders, in order to identify and amplify current achievements and to produce practical solutions in misalignments between values and actions. PAAR co-creates – with those involved – strength-enhancing interventions based upon an understanding of the root causes of success and achievement, rather than of problems and failures.

“Intergenerational Learning in Blended Environments and Spaces” (ILBES) constitutes the first attempt to build a common methodological framework without forcing the two methodologies together into some kind of unhappy ‘marriage’. Both methodologies aim to empower individuals to improve themselves and the community where they live; however, each one proceeds in a different way. While appreciate, imagine and design are central in PAAR, CSL starts by identifying and evaluating the needs of the environment (community), to further imagine solutions and design a tailored project, which is the first action of an CSL facilitator. In PAAR, instead, solutions are built collaboratively over the strengths of participants. This leads to a possible divergence between CSL (“starting from a problem”) and PAAR (“what is going especially well?”).

In order to design a learning methodology for a leaning circle between seniors and youths, the CSL approach was taken as the project layer while PAAR a means to find solutions. In this way, while the logics of problem-finding and problem-solving as the only strategies to begin a change can lead to a deficit-based thinking, PAAR’s strengths-based thinking allows a balance

by helping to engage in a conversation about what people can do and wish to do, by identifying, using and developing their strengths, gifts and talents.

Imitating PAAR pillars, the following pillars for the betterment of communication between seniors and young people were defined for ILBES:

1. **Space and Environment** are crucial dimensions already considered by both didactical approaches. “Space” (PAAR) refers to the concrete working/learning place (e.g. the telecentre), while “Environment” (CLS) is a broader place which includes the “space” (e.g. the neighbourhood). All didactical materials should reflect on the physical, virtual or perceptual space where the communication is taking place in, and provide solutions adapted to each space.
2. **Appreciation:** the question “How far are you feeling strengthened by this participation/useful for society?” is formulated for both target groups.
3. **Empowerment** makes participants feel more active and ‘in control’ of their own learning.
4. **Participation** is supported and encouraged by both source didactics, but a specific challenge in intergenerational learning is to achieve that each generational group appreciates the “lessons” (knowledge, values, competences) they can learn from the other generation.
5. **Ethics** address questions like “are we working ethically?”, “is this training aiming at something ‘good’?”, “who benefits?” (for the seniors, the benefit is less clear and needs to be more developed)

ILBES aims to produce a **community service-oriented action, reflection and learning**, i.e. a collaborative process of committed actions and reflective learning for personal and community development, where **learning is an effect of experiencing reflectively** (CSL does by learning and learns by doing, PAAR acts and reflects to turn negative into positive). In it, social innovation is supported by e-facilitation (Diaz & Rissola, 2008), social media and user-generated content (Kaletka et al., 2011). Group reflection (done publically, rigorously and systematically) rather than solely self-reflection is promoted, since change and improvement with regard to the starting point of each intervention should be effect of collective rather than individual actions and views.

Target groups analysis and training design

For a more informed training design, 250 candidate seniors and 250 candidate youngsters were surveyed in Spain, Italy, United Kingdom, Germany, Poland and Bulgaria (2011) and Croatia, Latvia and Lithuania (2014). The candidate seniors needed to be aged between 55 and 75 years old, were willing to acquire digital competences taught by young people and in return be interested to give advice to young people with a view to ameliorate their preparation for the labour market and adult life. The candidate youths needed to be aged between 16 and 25 years old, and were willing to make social work taking advantage of their digital knowledge, with a view to ameliorate their preparation for the labour market and adult life.

Samples were collected with help of local stakeholder organisations like telecentres, welfare centres, schools, etc. In the first sample (2011) seniors showed a range of educational background “types”: 26% were highly qualified while 21% had a middle school certificate; a third part was digitally illiterate while a quarter is middle-high e-skilled, etc. This educational heterogeneity of the senior target group was identified as a challenge for the design of the learning circle: how to tackle different target groups (well educated/low educated) in eScouts modules? How to deal with this diversity? How to benefit from it? The low e-skills level of most of the senior was identified as the main factor limiting their Internet use – rather than Internet access, which was not seen as a real barrier – reconfirming the need of interventions like eScouts to equip them with digital competences and avoid their exclusion from the Information Society. However, a polarization of their Internet profiles (in terms of competences and uses) was identified as an important challenge for the training that the youths would deliver to seniors, requiring to be carefully addressed by the training that would prepare the youngsters to become e-facilitators. This scenario changed with the second sample (2014), where a more homogeneous educational level among seniors (more than half held a university degree and had some digital background) shifted the focus of digital training to how to satisfy the needs of a better-educated group.

Regarding the youths, the project team learnt in the first case (2011) that youth respondents were a kind of socio-economic “elite”. at their early age (most aged between 17 and 21) they were well educated, had a good level of languages, low drop-out rates from school, high percentage of volunteering, and 94% had private computers with internet access. While this was a bias that could have been induced by the way they were recruited (i.e. via educational organisations and worked with a voluntary questionnaire) which tends to over represent “elites”, in the context of eScouts this was considered rather an opportunity than a fault, since the project could benefit from these “elites” to teach the elderly. In the second case (2014) the general educational level of youngsters was found to be rather lower and diversified, making even more challenging the exercise of preparing them to train seniors (who were well educated) on digital skills. Despite those differences between the cases, in both the youngsters said to have learnt what they knew about new technologies mainly at educational organisations (*formal learning*) and via *informal learning* (from relatives and friends or by their own⁴). By the contrary, the role of *non formal learning* (telecentres, job centres or libraries) was marginal for them. However, the critical, creative, constructive and community-oriented use of ICT that eScouts project family intend to promote takes less place at schools (where the critical use is occasionally stimulated) or informal learning (where this is contingent to the capacities of the improvised trainers), and more in non formal training courses embedded in social initiatives delivered by Third Sector organizations (where this is explicitly developed).

⁴ For a distinction between formal, non formal and informal learning see (Cedefop, 2009)

Training design and implementation

Based on projects' research, the intergenerational learning circle is structured in 5 modules, each one corresponding to each step illustrated in the figure below:

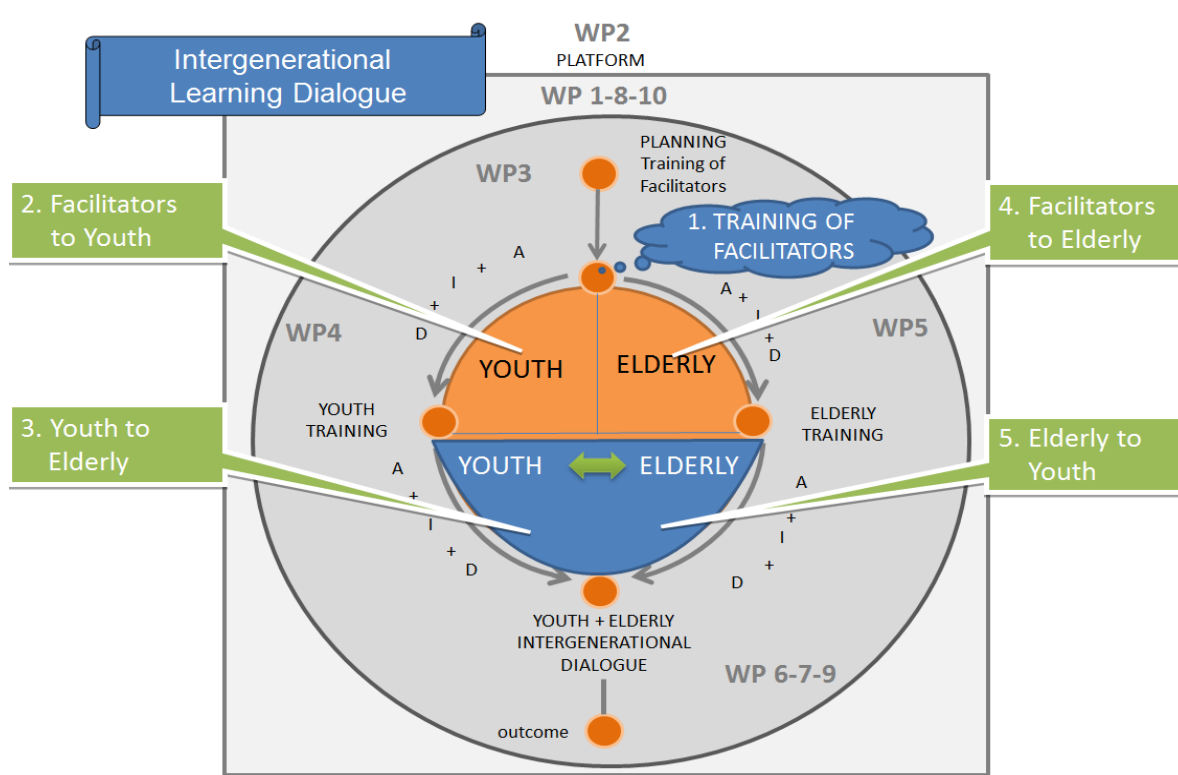


Figure 1.

While the modular design remains constant from one experience to the other, a couple of modules required adaptation to fit the needs of the second experience. In particular, Module 2 devoted to prepare youngsters to become digital trainers of the seniors was adapted to cope with a more exigent group of learners (e.g. efficient use of tablets for daily life purposes), while Module 4 devoted to prepare the seniors to become employability mentors of the youth incorporated entrepreneurship as a variant to get a job.

A group of community-based social innovation and eInclusion centres carried out the ILBES modular blended learning circle in six European Member States (Bulgaria; Germany; Italy; Poland; Spain; United Kingdom) for the first time between October 2011 and April 2012, while a second group will repeat the experience in three more (Croatia, Latvia and Lithuania) during the first semester of 2015.

In the implementation already concluded, and given the experimental character of the intergenerational blended learning circle, each partner of the consortium started by selecting two core facilitators, forming a group of facilitators who had already acted as trainers/facilitators in former initiatives. Before accompanying the entire blended learning path where 84 youth and 420 seniors were going to be trained, those facilitators learnt about the aims of eScouts project, the main characteristics of the two end user groups, the two main

methodologies and their merging into a new one (ILBES). At the same time, they acquired the fundamental skills required by the ILBES:

1. the project's Ethical Code (subdivided into main parts: be honest, act responsibly);
2. facilitation skills that strengthen intergenerational dialogue (the six Mobius qualities: mutual understanding; possibility; commitment; capability; responsibility; acknowledgement);
3. the eScouts Trust Wheel (achieve an outcome; raise awareness; identify concern; encourage discussion);
4. the eScouts Trust Wheel Observe Behaviours (observe behaviours; listen actively; ask open questions; end ethically).

The whole eScouts intergenerational learning circle was object of two complementary quality and evaluation systems: a) self-evaluation on location; b) at-a-distance ongoing monitoring and evaluation through an articulated quality plan that encompasses a comprehensive set of indicators: Profile (educational, civic, professional); Participation (n. of hours attended; interest to take part to the following module/s; self-evaluation of the participation during the module); Satisfaction (evaluation of: list of contents/methods/tools/evaluation-assessment/facilitators; means of communication); outputs (n. of facilitators/mentors/trainees; n./type of learning materials produced; type of evaluation/assessment methods-tools applied); Learning Outcomes (Knowledge; Skills; Competences). The quality system aimed to provide a first description of the knowledge/skills/competences formed in a way to facilitate their recognition, this is why the ECVET main concepts and terminology (EC, 2009) were extensively applied.

Further perspectives

On the basis of eScouts projects' experience, where the ILBES methodology was conceived and tested, a twofold strategy for the further development of community and educational centres offering digital services and training as **"eInclusion catalysts for intergenerational learning"** is proposed. eInclusion is understood here in the sense the European Commission uses the term in policy documents since Riga declaration (EC, 2006), which defined eInclusion as both inclusive ICT and the use of ICT to achieve wider inclusion objectives.

Firstly, there is a need to professionalize BES staff by supplying them with methods and practical know-how to facilitate intergenerational learning. This includes more elaborated job profiles and recognized sets of competences, tools to identify eInclusion local needs, more and systematic good practice exchange and international models of reference (in view of an increased European added value), the promotion of funding opportunities for telecentres, libraries, etc. (especially by creating awareness for their mission and eInclusion potential), and the mobilisation of the civil society.

Secondly, eInclusion should be embedded as a transversal field of activities into lifelong learning policies and thereby promote digital literacy on the European and regional policy

agenda as a means to strengthen social cohesion. This means extending the use of intergenerational learning and digital competence training as tools for the empowerment of citizens and their active participation in society; building over the digital capital of the youngsters on the benefit of society; better promoting and integrating blended and web 2.0 based learning opportunities in “traditional” adult education; further developing eFacilitator profiles, as well as providing “traditional” adult educators with digital teaching and facilitating skills; professionalizing eInclusion initiatives to allow them becoming an integral part of adult education in European regions and increasing their European added value; promoting BES as competence centres and transversal actors for the digital advancement of lifelong learning.

If we truly want individuals to shape their own education and vital biographies building over their strengths and the legacy of other generations, with an ethical and community sense, this means that not only the necessary resources and access rights must be afforded, but also – and above all – the skills to shape their biographies on their own responsibility. This includes, more than ever, digital skills enabling them to find better employment opportunities and to participate meaningfully in society. Intergenerational learning – facilitated by community-based social innovation and eInclusion centres and supported by ICT means – seems to be a worthy approach to reach this aim.

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TECHNOLOGY AS A VEHICLE FOR INCLUSION OF LEARNERS WITH ATTENTION DEFICITS IN MAINSTREAM SCHOOLS

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Abstract

The potential of technology for supporting educational processes of participation, collaboration and creation is widely accepted. Likewise have digital tools proved to enhance learning processes for disabled learners¹. A currently topical group, politically and educationally, in the discourse of inclusion is learners with extensive developmental and attention deficit disorders². This paper investigates the potential of technology for supporting the inclusion of this group in the general school system, i.e. into mainstream classes, using technology as a tool to join, participate and contribute – and as a vehicle for general human growth in their learning community. The paper presents the primer results and describes and discusses the challenges of both teachers' and learners', involved in the inclusion process. Finally, on the basis of findings, a typology of tools is suggested, which may support inclusive teaching and learning for the target group in question.

Introduction

In 2012 the Danish Government passed a law on inclusion, which requested public schools in Denmark to include 97% of all learners in the mainstream education system. As a consequence, many learners, who earlier visited special schools and had Special Educational Needs (SEN) teachers, now had to be included in mainstream classes with mainstream teachers. This is a challenge for the schools, for the SEN learners, for the mainstream learners and for the teachers involved. While pointing to the lack of specific tools as well as competences in teachers for handling inclusion of children with extensive developmental and attention deficit disorders, school leaders and teachers are looking for new ways to handle this challenge. It's a very broad group of SEN learners, who appears to have learning problems and struggling with problems such as: Lack of attention, selective and continuing attention and response inhibition as well as lacking ability for planning, promoting, strategic thinking, change in attention, flexibility in working memory, self-regulation and self-monitoring (Hansen & Sneum, 2008). The investigation, on which this present piece of research is based,

¹ e.g. Supporting dyslexia students with digital tools such as text-to-speak-programs or writing-support programs.

² e.g. Attention Deficit Hyperactivity Disorder (ADHD), Attention Deficit Disorder (ADD), Autism Spectrum Disorder (ASD), Autism etc.

is part of a work package in a wider research project, Ididact³, which employs ICT as a vehicle in the challenge of inclusion of learners with extensive developmental and attention deficit disorders (focus learners) in mainstream schools.

The Salamanca Declaration (UNESCO, 1994) and United Nations Convention on the Rights of Persons with Disabilities (United Nations, 2006) prescribes, that all states should provide an inclusive education system, where disabled children are able to access inclusive education where they live and receive individualised support required within the general education system. Ainschow (Ainschow & Booth, 2002) defines inclusion as “the continuous process of increasing the presence, participation and achievements of all children and young people in local community schools”. Qvortrup (2012) introduces three levels of inclusion, which he argues may form different kinds of inclusion: i) Physical inclusion is when the learners is (passively) present at school; ii) Social inclusion is when the learners is (actively) present and seems part of the social community that exists among peer at the same age (the student have friends); iii) Academic inclusion is when the learners participates (actively) in the educational programme, contributes to the assignments and achieves learning results from that. To some extent we are able to directly measure these levels of inclusion: Is the student present in the classroom, does he/she collaborate or play with peers, and does he/she receive good grades? However, Alenkær (2010) presents yet another attractive definition of inclusion, which places the individual in the centre stating that an individual is only, in a qualitative sense, fully included, when he/she experiences him/herself as physically, socially and academically included. The authors of this paper hold the position that a process of inclusion may also be viewed as a learning process – a kind of socialisation process, in which learners are developing to become capable human beings, who achieve knowledge and competences through experiences – academically, socially & culturally (Lave & Wenger, 2005). To design a learning context, in which this is possible, it is useful to distinguish between what’s important for an individual and what is important in a community. Finally, it is important to assess which learning competences all stakeholders need in order to become an empowered human being in the complex and constantly changing world of today. The envisioned learning goals of a person’s inclusion and development process may be characterised by a set of vital features and values, all of which find support in various learning theoretical positions (Voldborg & Grum, 2011):

It is important to be heard (Dysthe, 2003), recognized (Honneth, 2007), get experiences (Dewey, 2005) and opportunity to explicate these experiences (Vygotsky & Lindquist, 2004) to get courage and ability to join learning and life with an identity as a learning human being. It is important that these actions take place in a process of negotiation with other learners (Lave & Wenger, 2005), in which the individual learn to take the perspective of others (Mead, cited

³ Ididact is a research project, running three years (2013-2015), funded by the Ministry of Education (MBU). The project seeks to test and develop new methods and digital tools that may promote inclusion and differentiation in the teaching and learning. Ididact facilitates action learning at 11 schools and collect data with 46 teachers’ in 15 classes. The interventions in the classroom are tried out with more than 500 learners age 6 to 16 years – including 58 learners with extensive developmental and attention deficit disorders (focus learners).

in Dysthe, 2003). The learning process must be scaffolded (Bruner, 1999) and must be conducted in the zone of proximal development (Vygotsky, cited in Lindquist, 2004), resulting in the learner's experience of being immersed in a feeling of flow (Csikszentmihalyi, 2005). Viewed in this perspective, the learner develops competences and awareness of competences. In other words, the goal of inclusion is, that the learner obtains L2L-competences (Sorensen, 2006) and becomes an active, empowered, independent, participating citizen in a democratic society – a citizen with an ingrained motivation to take part and make a difference in democratic life (Sorensen, 2007a; 2007b). In addition, it appears important to pick up knowledge, skills and competences for investigation, problem solving, critical thinking and creativity (OECD, 2008).

The general potential of ICT for supporting educational processes of participation, collaboration and creation is widely accepted (Sorensen, 2009; Dalsgaard & Sorensen, 2008). In a more focused perspective, ICT is internationally recognised as a valuable tool for inclusion (Waller, 2013), particularly for people with disabilities, where technology can improve their quality of life, reduce social exclusion and increase participation (WSIS, 2010). There seems to be extensive evidence of the impact of ICT on:

1. motivating learners;
2. engaging low achievers;
3. supporting differentiation between learners;
4. improving behaviour;
5. increasing confidence and management (Balanskat et al, 2006; Blamire, 2009);
6. cognitive processing;
7. independent learning;
8. critical thinking;
9. teamwork and
10. enhancing a student-centred learning approach (WSIS, 2010).

From as long list of research, benefits are reported from using a variety of ICT hardware and software tools for inclusion in education:

1. laptops (Corn et al, 2012);
2. tablets (Clark & Lucking, 2013; Flewitt et al., 2014);
3. learning platforms and mobile technologies (Naismith et al, 2006; Passey, 2010);
4. virtual learning environments (VLEs), large multi touch surfaces, multi media rich resources (Waller, 2013), electronic visual scheduling systems (McKnight & Davies, 2012);
5. collaborative learning technologies (Balanskat et al, 2006);
6. assistant technologies (Winther & O'Raw, 2010; Shaw & Levis, 2006; Mavrou, 2013).

We may assume that the recognized benefits themselves of using these technologies also automatically would give rise to new pedagogical approaches. But this does not seem to be the case, one major reason being a lack of ICT competence development amongst teachers. The majority of teachers have not been introduced to these technologies and are not skilled in utilizing their potential in the special pedagogic optic, which is required for the target group in question. According to the European Commission (2013) the potential and benefit for inclusive learning of ICT is not realized, as in many cases appropriate pedagogic methodology and models that truly integrate and operationalize the potential of ICT in a strategy of inclusion, still remains to be generated (Waller, 2013).

Research design

Very few research projects and research designs provide a holistic view of the complex challenge of using ICT in inclusive education (ibid.). It is difficult to capture the complexity of the research field with its many influencing factors. Therefore, in an attempt to meet this challenge, the methodological approach of “Educational Design Research” (EDR) as introduced by McKenney & Reeves (2012) is applied. EDR may be defined as a “genre of research, in which the iterative development of solutions to practical and complex educational problems also provides the context for empirical investigations, which yields theoretical understanding that can inform the work of others” (ibid. p.7). Ididact is an iterative and explorative qualitative research project, where data is collected in a real school context. It is a case study in the frame of Action Research (AR) (Jungk & Müllert, 1998; Tofteng et al., 2012) and EDR using a hermeneutical, phenomenological interpretation of data. It is crucial for our data collection, that the unfolding research process goes hand in hand with the involved teachers’ work and interventions into the field of study, so the process becomes a learning endeavour in terms of learning how to work with SEN learners and integrating ICT in the classroom. Therefore, we designed this piece of research using an AR/EDR approach, where the researchers are included as participants – and professional dialog partners and facilitators of the transformation processes – at the schools involved. In the present case we are studying the problem in its real life context: The mainstream Classroom, where the borders between phenomenon and context are unclear. We attempt to collect data from multiple sources, and bring them together in a data triangulation.

Analysis and findings

The data production and collection was done using various methods and instruments, all of which evolved within the following four themes of interventions as presented below:

1. The challenges of the teachers, when including the focus learners

The teachers were challenged with:

1. A feeling of deficiency in terms of their own professional knowledge about methods, tools, experience and competences in their educational practice in terms of working inclusive with ICT and focus learners;
2. Understanding focus learners needs, behaviour, interruptions, relations, abilities and offered conditions;
3. Responsibility for a high academic level, appropriate attention and a pleasant learning environment;
4. Lack of participation/responsibility for developing inclusive schools from colleagues, leaders and parents.

2. The challenges (as viewed by teachers) of the focus learners in terms of learning and schooling

The pre test indicated that the challenges of the focus learners varied widely: Generally they were challenged in proportion to memory, attention, persistence, concentration, hyperactivity, impulsivity, behaviour or social competences. The majority had problems with attention, 50% struggled with hyperactivity, and 25% of the group showed behavioural disorders. They were all challenged in proportion to memory, concentration and persistence. 75% had relatively weak – and not age corresponding – pro-social competences. Knowledge from the pre test was used to guide the teachers in selecting inclusive ICT based interventions. In the post test a significant reduction was documented in the level of attention problems, hyperactivity, impulsivity and behaviour problems, while no or minor change in pro-social behaviour, emotions and problems with peers was observed.

3. The experiences of the teachers, using inclusive ICT based interventions

Through triangulation of data following types of interventions and technologies was found:

Table 1: The experiences of teachers, using inclusive ICT based interventions

Intervention	Used technology/ICT	Impact of ICT on focus learners
Structure & Overview	Timer Digital planning and management: Timetable for lessons or projects Learning Management Systems (LMS) Digital templates for assignments	Plans with strictly time schedule for lessons and activities have a positive impact on participation, self-monitoring and task solving. Especially a timer showing remaining time for a task is a valuable tool. Digital templates enable to work independently and structured with assignments and LMSs help to organise and find learning content.
Shielding & Focus	Earmuff (with/without music) Teacher-microphone and learner-receiver Periodic, individual work on iPad or computer	Teacher-microphone/learner-receiver has a positive effect on focus learners' attention. Restless learners became calm, felt concentrated and able to work with the tasks. Sensible learners felt the raised teacher voice annoying. Using iPad or computer generally increased concentration and focus.
Comprehension & Differentiation	Multi-media rich materials to the learners (screen casts, video instructions, sound instructions) Text-to-Speech Digital learning resources Digital books/texts Flipped Learning Game based Learning	Flipped learning, scalable templates and multi-media rich assignment for the learners had a positive impact on the learner's participation and contribution. Concepts are trained successful using Google picture searching and repetition in online game based learning tools. A few learners tested a game based learning environment for mathematics with positive impact with respect to focus, concentration, persistence and problem solving.
Production & Dissemination	Multi-media rich assignments from the learners: Text, Pictures, Photos, Voice clip answers, Video clip answers, Graphics, Animations Assistive tools: Text-to-Speech, Speech-to-Text, Pre-dictation	According to both learners and teachers, the production of multi-media rich assignments increases motivation and engagement for almost all students. Learners challenged in their short time- and working memory, do not benefit from this opportunity without other additional interventions. High impact is observed with the assistive tools.
Collaboration & Knowledge Building	Cloud based file management and file sharing Digital portfolio Virtual presence	In the LMS learners communicate and collaborate with their peers more concentrated and focused (if the task is well designed, structured and tailored to their needs). They store assignments online, return to them for repetition/remembering concepts, and get help from peers or teachers through lurking in the shared content or communication in chat or mail system.

Teachers uses a variety of hardware (e.g. PCs, laptops, iPads, Nexus-tablets) and create interventions for the entire class, but observe specific benefits and challenges for the focus learners in terms of ability to participate and contribute in the learning community. In some cases one-tool-to-one-learner is planed, in other cases one-tool-to-two-learners, or one-tool-to-three-learners. Both teachers and learners express, that ICT in education is a highly motivating factor. Applications, digital learning resources and templates help all focus learners and function as drivers through the various tasks. Computers are useful for writing and working in larger projects, while tablets are valuable as a multi-media production tool, a training tool, a pause tool or a private planning tool. While learners working one-to-one or one-to-two are more likely to participate, focus learners disappear from the task when working one-to-three. In the final survey the teachers express that they during the interventions experienced less noise and disruption (50%), less exclusion of the focus learners

(40%), higher professional competence with respect to including the focus learners (50%) and improved conditions for the focus learners' time spend in school (80%).

4. The experiences of the focus learners, using inclusive ICT in their learning processes

Through interviews with both focus and mainstream learners it became clear, that they all felt a higher degree of pride in their schoolwork when using ICT. One focus learner expresses happiness and joy, when she – using ICT – succeeds in solving a task. There is also indication that the focus learners' need for help decreases, as they seem to be able to work more independently. The learners recommend wider use of compensatory applications and tools for structuring and managing time. They express more joy and engagement when using computers and iPads, and appreciate their cloud based LMS, as they are able to access resources and assignments – and to collaborate with peers. The teacher-microphone/learner-receiver tool is popular, as “the teacher became more clear, and the headset was good, when one had to be concentrated” (focus boy, age 14). The learners also convey challenges and implications when using ICT in the school. This is primarily in relation to the teacher's lack of ICT skills, the teacher's unfocused use of ICT, and finally, unstable ICT infrastructures in the schools.

Discussion

From the perspective of Ainschow's definition of inclusion (Ainschow, 2002), the schools in this inquiry may be viewed, to a certain extent, to succeed with increasing the presence, the participation and the achievements of learners with attention deficits in local community schools and mainstream classes. But in what sense were the learners included, and in what ways were the ICT interventions significant? Following Qvortrup's distinction between physical, academic and social inclusion (Qvortrup, 2012), it is fair to say that most of the interventions primarily had an impact on the physical and academic inclusion, and less so on the social inclusion dimension. Using ICT for, not only *shielding & focusing*, but also for *structure & overview*, seems to help focus learners to join and participate in classes in more smooth and quiet ways, spawning more attention and causing less conflict. These two intervention types may be viewed as basic conditions for SEN learners to participate and physically join, in fruitful ways, educational activities in the classroom, together with their peers. They know what to do, how to do it, when to do it, why they do it, with whom they do it – and for how long, using what. The teachers have gained increased insights into the special needs area. Thus, their abilities had grown in terms of being able to create a learning environment, more accessible to the focus learners. As recommended by Dysthe (2003) and Honneth (2007), the SEN learners appeared to be heard and recognized as who they were, thus, accepted as a legitimate participant of the community (Lave & Wenger, 2005). Distracting impressions were minimized, and focus increased. It may be said that they had been moved to a position, from which they were ready for academic inclusion.

In other words, it may be concluded that when the focus learner is well supported, he is able to participate and contribute in academic activities in the classroom. The focus learner's use of

ICT as a tool for wider *comprehension & differentiation, production & dissemination* is useful, when he/she as a consumer is facing new learning challenges, or when he/she as a producer explicate his knowledge. Both processes benefit from compensatory digital tools, such as e.g. Text-to-Speech, Speech-to-Text or Pre-Dictation. The general difficulties of the focus learners in terms of lacking attention, concentration, memory, persistence and arousal (Hansen & Sneum, 2008) seem to impose a challenge, when they are participating in learning activities. But we might say that a mix of multimodalities and compensatory tools seem to have a positive effect and stimulate them, not only to stay focused, but also to produce outputs more easily – i.e. working in flow (Csikszentmihalyi, 2005). A future research challenge will be to investigate the reason for this. For now there is sufficient ground to conclude that use of ICT interventions for *comprehension & differentiation, production & dissemination* does in fact increase the chance of academic inclusion of the focus learners.

Learners and teachers agree that it is easier to collaborate and share content, when using ICT. Low achievement learners lurk to the assignments of peers and learn from them strategies for solving their own tasks. However, to be socially included is not equal to taking part of collaborative tasks in school (Alenkær, 2010). One also has to be selected as a friend, to contribute in discussions and take part in the social activities in pauses and after school. No indications that the ICT interventions had an impact concerning social inclusion, and our pre/post test showed no significant progress in the learners social and pro-social behaviour. However, we did register indications that the knowledge/insight of the teacher with respect to the special needs and strategic use of five types of interventions of the focus learners, did inspire the focus learners to participate more equally and be less excluded in the classroom: *Structure & Overview, Shielding & Focus, Comprehension & Differentiation, Production & Dissemination, Collaboration & Knowledge Building*. We propose use of and further investigations into using this five-types-model of including, ICT based interventions. We are discussing, if the model has an incorporated progression like a hierarchy of needs (Figure 1 left), or it should be presented more dynamically (Figure 1 right). This issue still remains to be decided through future research.

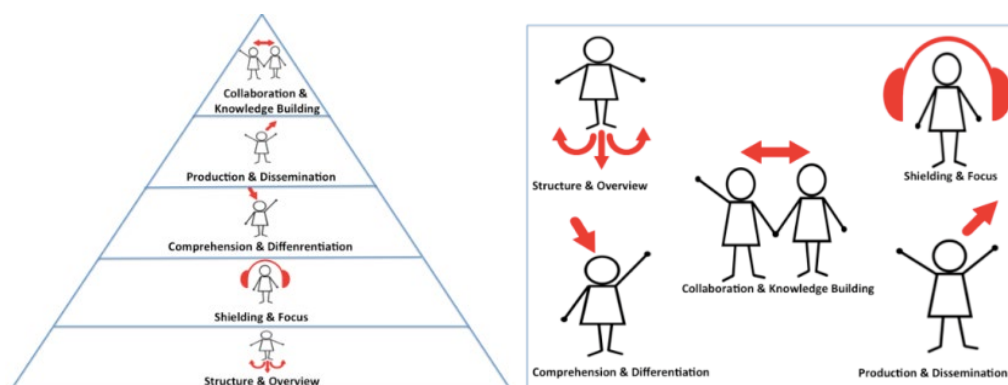


Figure 1. Iterations of a five-type-model of including ICT based interventions – hierarchy left and dynamic right

Similarly, following Alenkær's definition of "full inclusion" (Alenkær, 2010), it is also part of our future research challenge to examine, to what extent using use of the ICT based interventions enhances the focus learner's self awareness in terms of experiencing himself/herself physically, socially and academically included. The EDR approach has worked well for this study. The teachers gained new knowledge about the focus learners' special needs, and about ICT as a vehicle for inclusion. Together with the researchers they also developed new methods in their practise. The researchers recognized the teachers' challenges and scaffolded them in their further development of practice. The teachers discussed the new methods and experiences with their colleagues and the researchers, and – exactly like the focus learners – they became empowered to act and enhance their daily practise, using ICT based interventions and developing sustainable L2L competences (Sorensen, 2006).

Conclusion

This paper reported on an investigation of using ICT for inclusion of learners with extensive developmental and attention disorders in mainstream schools; In other words, the ICT potential for increasing these learners' presence, participation, contribution and achievements in the school context. The general results of this investigation points to ICT interventions as effective tools to empower, hand in hand, teachers and learners in the meeting with this challenge.

In sum, our research on ICT as a vehicle for inclusions indicates:

1. interventions with ICT have high impact on physical and academic inclusion, while less so on social inclusion;
2. using ICT for shielding, focusing, structuring and over viewing helps focus learners to join, participate, and maintain attention, while to some extent avoiding conflicts;
3. specific planning and strict time schedules for lessons and activities, supported by digital assignments in LMS/VLE systems enhance participation, attention and self-monitoring in task solving;
4. use of ICT enhance comprehension, differentiation, production, dissemination and compensation and promote the learners' abilities to participate and contribute;
5. the teacher's knowledge of the learners' special needs, and the teachers' use of the five types of interventions did have a positive effect in terms of supporting focus learners' to participate more equally in the classroom.

While our pre/post test showed no significant progress in the learner's social and pro-social behaviour, no indication was found of ICT interventions having an impact on social inclusion.

This paper finalizes by suggesting an ICT-pedagogical strategy containing a typology of tools and interventions: Structure & Overview, Shielding & Focus, Comprehension & Differentiation, Production & Dissemination, Collaboration & Knowledge Building. Utilizing

this typology in the pedagogical strategy is likely to enhance the process of inclusion in classrooms of learners with extensive developmental and attention disorders.

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EDUCOMMUNICATION PRACTICES: HOW TO PLAN AND IMPLEMENT COMMUNICATION MANAGEMENT PROCESSES FOR EDUCATIONAL PROJECTS MEDIATED BY COMMUNICATION TECHNOLOGIES

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Communication technologies in educational projects

The use of communication technologies in education was a natural step when we consider the context of digital media and their adoption by society for various purposes by people of all ages, social classes and both genres and how it has led to deep changes especially in the way people relate to each other. Martin-Barbero (2005), Jenkins (2009) and Castells (2003), among others, reflect that the digital media are transforming the relationships among people, mainly the new generations who are more exposed to the use and effects of these tools in a daily basis. And the adoption of these tools by formal education put focus on the necessity of a better knowledge about the communication management for educational projects mediated by technologies.

As a matter of fact McLuhan (1996) has reflected about the importance of knowing the communication processes as that every new medium development modifies the mankind relationships and creates a new human environment. He commented about how fascinated we are with every sort of technology and that the reason for this is that the media are extensions of human body.

The process started with data processing courses for children and teenagers to develop their basic competence with first digital tools. Over the years the rapid development of communication technologies has made them increasingly collaborative and much more complex practices have emerged and are now called pedagogical-communicational practices.

The more communication technology has been embraced in the classroom, the more pedagogical practices have been debated, as resources have become increasingly collaborative and have brought in deeper reflection on the need to update pedagogical practices and to develop those competences that are critical for students' effective functioning in a highly technological society as today's. But to understand this context only from pedagogical or technical view is not enough. We must understand that we are talking about technologies which are making education possible by making specific communication processes happen.

Martin-Barbero (2005) argues that culture changes as soon as the technological mediation of communication becomes structural and is no longer instrumental and claims this is a turning point in human history as the type of technology we have today is the one to constitute the structural component for developing a true communicative ecosystem. He claims that computers enable the processing of raw data such as abstractions and symbols resulting in a new relationship between the brain and information which replaces the traditional body-machine relationship.

So, we must emphasize that we are not talking about pedagogical practices only but mainly we are talking about focusing our classroom dynamics planning mainly in the communication processes needed to reach educational objectives aimed. Classroom actions require more reliance on communication assumptions as digital tools allow integrated use of various languages within one single learning environment – be it face to face or distance education. There is today an evident need to more effectively manage this specific communication by taking great care to prevent practices from getting static and encourage teacher's and students' reflection and problem –solving (Soares, 2014).

This brave new world requires rethinking communication processes from the perspective of the new languages that are promoted by digital technologies so that classroom participants feel encouraged to (re)construct their own ways to interact with multi- or hypermedia technology and other classroom participants (Mello & Assumpção, 2012; Soares, 2014). According to Hattie (2009), unplanned use, choice and integration of digital communication tools in learning environments or not considering the specific competences that are aimed to be developed and the educational objectives aimed to be achieved may even prevent the achievement of such objectives. Therefore, communication processes must be facilitated by educators' planning and managing activity implementation in learning environments by using one or more technologies, taking into account learning objectives aimed at (Costa & Lima, 2002). Throughout these processes, educators will be responsible for mediating student-student, student-medium and student-language interactions within the learning environment, as well as for encouraging and strengthening dialogue and pluralism between all participants.

Soares (2014) adds that managing communication in learning environment tackles planning communication processes and the use of communication technologies as communicative ecosystems with interrelations of their own and upon a democratic and creative basis. The learning environment must be framed from a dialectic view between people and their reality, where dialogue is built through exchanges of individual arguments in the search for consensus. Throughout this process, all the participants stand on an equal basis – they are all issuers and receivers of interactions, at the same time.

Educommunication

Considering this context, from 1997 to 1999, a group of researchers from Centre of Communications and Arts (NCE), School of Communications and Arts (ECA), University of Sao Paulo¹ (USP, Brazil, coordinated by PhD Ismar de Oliveira Soares, developed a study with 176 Latin American, Spanish and Portuguese specialists on educational projects mediated by communication technologies. The results had pointed to the emergence of a new field of study they had called Educommunication and which reflects a convergence between the areas of Communication and Education as well as among all areas of the humanities. Its main goal is the social transformation of people in order to prepare better participative citizens for this new technological society.

The researches about the interrelationships among people and on the identification of new pedagogical methodologies for educational practices mediated by communication technologies. It emphasizes the dialectic interaction between people and their reality, where all the agents of the process are transmitters and receivers at the same time throughout the mediation process of communication technologies (Soares, 1999).

“Educommunication is a set of actions focused on the creation of communication ecosystems and creative education spaces, favoring both the dialogical relations between people and groups as well as creative appropriation of communication technologies along the processes of cultural production and knowledge dissemination. The new field seems to be interdiscursive, interdisciplinary and mediated by information technology”
(Soares, 2002, p.91).

Martin-Barbero (2002) alerts for the fact that one of our big challenges is to establish a communicative ecosystem at schools based on diversified culture experiences, the surroundings of new information and communication technologies, and still provide education as the place where you have a learning process that preserves its enchantment. For him there is no way to have real transformation of learning structure, methodologies and practices without a transformation of the current school mentality.

Previous researches have shown that this new field can be studied from the following areas of social intervention: communication management for education mediated by technologies – presence and distance education; media education; technological mediation at education; pedagogy of communication; epistemological reflection of the new field. Also educommunicative practices must be planned mandatorily considering the development of some specific competences as leadership, dialogue, autonomy, problem solution and decision making.

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Specifically about the communication management for education, between the 1920s and 1930s, Freinet (2004) built the case for communication management processes oriented towards education in learning environments lying upon what he called 'education as the expression of ideas' – all those involved in the educational process, educators and students alike, sending and receiving messages, alternatively playing the role of issuers and receives so as to develop the exchange of ideas and hence strengthen the competences that were aimed at.

However, along the whole 20th century the most widely practiced approach has been what Freire (2002) called 'banking education', in which learners were viewed as passive recipients ideas that were expected to be acquired by memorizing rather than by reflecting on them. The introduction of communication technologies not only recaps on propositions for active and collaborative learners but also makes the record of such collaborative and reflective practices (as well as of their outcomes) available at both face to face and distance education. This new set of possible applications and results has been responsible for deeper reflection upon reviewing, replacing and updating teaching and communicational practices as new media also allow checking the effectiveness of the communicational approaches embraced.

Paulo Freire (2002) claimed for emancipation through education in the early 1970s. For him, education means dialogue, that is, communication: "not knowledge transfer, but an encounter of interlocutors seeking negotiation of meanings" (Freire, 2002, p.69 – free translation). He has reflected on the emancipation of education by arguing that education is dialogue, is communication: "... it is not just knowledge transference but a meeting of interlocutors who look for the meaning of meaning" (Freire, 2002). The learner must be respected as a thinking person with previous knowledge and internal references and who is able to reflect on and discuss about a specific topic based on previous experiences and knowledge. For this author the dialogue is established only when there is an adjustment of signs and so that those involved can discuss about a particular object for the construction of new meanings.

The legitimate dialogic process happens only when the contributions among participants are real and authentic, with real intent of exchanging views and consequent joint reflection without any manipulation intention from any participant, with no room for oppressor or oppressed, just the same interaction for the joint construction of knowledge about a specific theme. The current posture of many educators must be reviewed in order for them to assume more a mediation posture than a mere transmission of content or even an oppressive posture, imposing their points of view with no room for contributions and true reflections.

Also Bohn (2008) explained that dialogue is a process of thinking together. It is a joint reflection and cooperative observation of an experience and it happens when there are meanings flows being shared between and through people, which are the glue that holds people and society together. We are talking about listen, watch, pay attention to the actual process of thought and to the order it happens. And we are focused on the perception of the difficulties of a group to really think together besides all their conflicts and incoherent thoughts.

The Interrelationship Communication and Education – Implementing Communication Technologies in Education

Dealing with the dialogic texture of communication, we observe that the individual, as a social human being, interacts and is interdependent of other individuals. He or she communicates in otherness, and this individual suffers the mediation of many factors when he or she communicates, which influences the final reception of the original message once sent. There is a fragmentation of cultural *habitat* that Martin-Barbero (2002) calls “*destiempos*”² situation composed by a large cultural diversity developed along different times, in past, residual and emerging cultures. Therefore, it is necessary to ask for the ways that people get together, how they recognize each other in a context full of communication media options which offer many contents to different consumer profiles.

According to Martin-Barbero, that fragmentation: “reinforces an older and more structured social division that is the division between the ones who take over in some ways or have information to make decisions – and we know that today power is information – and the population to whom the media are addressed” (Martin-Barbero, 2002, p.45).

Back to the discussion on interrelations between Communication and Education, Communication is still reduced to a mere instrumental dimension and there is not a strategic thinking of the society’s communicational processes and their relations to education. The big challenge here is to induce the arising of a new educommunication culture that adopts the new communication and information technologies, and takes longer on planning how to merge all different narratives, writings, representations and languages to transform the perception, which means changing one’s perception, knowledge and feelings (Martin-Barbero, 2002).

Actually, the emergence of digital media has contributed to bring up new knowledge sources for everyone, meaning that school no longer plays the main role as knowledge source. There is a call to think of new educator’s job description and educational methodologies, in order to change pedagogical practices from a one-way to a two-way communication model, supported by Freire (2002) and Martin-Barbero (2005) among others, to establish meaningful relationships for learner and teacher, for teacher and learner, and among learners.

The mutual interaction and dialogue take key roles in the process of knowledge and critical thinking development. The educator ceases to be a content transmitter, and becomes a questioning developer, introducing more complex issues to his or her students. There is a huge challenge on the horizon of knowledge construction as we face a very fast exchange of information across the network, as compared to the knowledge that teachers have about technology and their ability to be up to date on this subject. That seems to cause a decrease of teacher’s power as the only holder and transmitter of a student’s knowledge. More than ever,

² Coexistence of different political-social-cultural aspects which emerged at different moments in a society under different historical contexts.

the adoption of new technologies demands that educators learn how to dialogue with their learners, how to mediate an exchange of arguments for the critical thinking development.

The findings presented here indicate an urgent need of investing on planning of communication processes in order to organize the use of several media adopted to reach the educational goals.

Communication management consists on thinking of communication as a process in which the agent responsible for the management will mediate the relationships in a specific environment to promote dialogue and pluralism (Costa & Lima, 2009). When we talk specifically about communication management in educational spaces, we mean to work on planning and conducting achievement for programs and projects articulated in the context where the interrelation Communication / Information / Education happens, creating and implementing communicative ecosystems (Soares, 2002).

It is important to think of reviewing educator's approach, as this agent must really understand the way the media adopted can be used for educative purposes, and understand the kind of interaction they let him do with the learners, in order to intensify the educational process. First of all, educators must be taught about the importance of communication for education and about the influence of each factor that affects the mediation process, depending on the medium adopted when they are using digital media to teach. These educators must understand the new pedagogical approach, which means that they are responsible for the learner's transformation, and not only for transmitting content to this one. Educators must learn how to stimulate and encourage learners to reflect about a content compared to their previous knowledge, in order to confirm or update that knowledge, independently of their age. More than that, they must learn how to mediate these communication processes in educative environments.

As mediators they should be responsible to think of activities that stimulate a student to argue about a content previously introduced to his or her colleagues in a present or virtual classroom, focusing on positive provocations and collaboration among all participants. Both as mediators or communication managers, they must consider their practices to aim the knowledge construction process based on a consistent dialogic communication. They must know and make good usage of technologies adopted to mediate communication processes by developing strategic plans that hold a detailed description of all educational goals, as well as the respective communicational actions that must be present to reach them.

Based on Orozco-Gómez (Baccegá, 2002), that specific training might cover critical and multidisciplinary aspects, including research and management planning, in order to help the communication manager to be

“a professional able to build not just an instrumental commitment, but also a political, cultural and educative commitment to society, based on communication and culture of his/ her time” (Baccegá, 2002, p.13).

The communication manager is:

“a professional that thinks of his/her activities as a creation of dialogic spaces, and not just as simple emission of a one-way information, found in just one source. He/she is conscious of communication role in contemporary life and this professional must work in an ethical and democratic way, supporting the rights to information, freedom of speech, and access to knowledge. And only when he/she puts his/her knowledge to the service of those principles, he/she is acting in an autonomous and independent way, making communication a space of dialogue and relationship” (Costa, 2009, p.162).

Only then it will be possible to guarantee the correct usage of technological resources, and optimize the communication among people in a community, counting on everyone's commitment and creativity (Soares, 1999).

Planning and Implementing Educommunicative Dynamics in Classroom

We want to make clear that this initiative was not produced by the media company, nor is it geared publication exclusively for teaching public, but the insertion of Educommunication theme in the Sunday page of a major Brazilian newspaper. This is the Educom.JT project, the page “Parents & Teachers” which was published on Sundays.

It was developed between 2006 and 2007 and was designed in collaboration between the NCE (ECA / USP) and Jornal da Tarde (O Estado de S.Paulo News Group) with daily circulation in and capital of the State of São Paulo.

The page built every week was a lesson plan proposing new ways of approaching knowledge with mediation of communicational processes. The methodological approach was clear: working knowledge of a transdisciplinary way with educommunication approach, favoured several languages, promoting the interaction of knowledge and proposing a dialogic practice.

Several areas of knowledge were addressed: Science, Art, Music, Theater, Physics, Chemistry, Portuguese, Geography, History, Literature, most often crossing several of these knowledge, ensuring the introduction of print media, in this case, the Jornal da Tarde in the school environment. The page consisted of three parts: background on a theme of journalistic perspective; presentation of a roadmap of educational activities designed to bring the topic to the classroom. Often this script class extended for two or more classes; organization of the additional information to facilitate teachers to research the issues.

The NCE (ECA/USP) initiative intended to disseminate the knowledge produced by public and private universities and among those involved in educational task, public school teachers, mostly in a simplified manner, establishing a bridge between academic knowledge and the school routine. The construction of the column involved a team of educommunicators, who had several functions: theme definition to be developed, direct contact with specialist teachers of knowledge area chosen, joint construction work of the class with the expert teacher. After

finishing the assembly, the class was sent to the final review of the NCE coordinator, PhD. Ismar de Oliveira Soares.

Educommunication approach is understood as a process that runs through all the dimensions of the human being and should be strongly linked to the historical moment and the everyday. Educate in this sense is not impart information and shaping behaviour but promote the creation of spaces for communication between different sectors of society, learning to live with the media (newspaper, book, television, film, video, computer, internet) and making use of them. In this sense, the role of the teacher goes beyond a knowledge diffuser. It happens to be a mediator of the reframing process of thinking, feeling, living and express yourself. It's who assists the student to tread a path between the different sections of the world of technology

NCE (ECA/USP) team made a specific review on the suggestions published and based on them they developed a step guide to plan educommunicative dynamics processes which we are listing here:

Planning previous actions: choosing converging disciplines which will be involved; defining objectives and competencies to be worked with activity; defining profile of students who will participate; description of the dynamics to be performed; definition of the communication technologies which will be used; description of teacher's mediation along the whole process.

Implementing educommunicative dynamics: division of students in small groups (4-5); presentation of the issues/topics to be addressed by each group; presentation of rubrics which will be used to evaluate the process; definition of communication technologies students will use to develop and present the projects; teaching students how to manage the communication mediated by the technologies they chose; mediation and orientation of the groups along the development of the project focusing on the dialogical and protagonist dynamics among students; final presentation of the pieces; joint reflection on the results reached; self-assessment of the participating students.

The results were very interesting, and throughout the year and a half (March / 2006 October / 2007) in which it was held, the NCE (ECA/ USP) staff and Jornal da Tarde team responsible for this column received the return of many educators detailing on the implementation of lesson suggestions and results.

Finally we would like to emphasize that the basis of these educommunicative dynamics which make use of these various technologies, is reflective dialogue. And the legitimate process of dialogue only happens when participants' contributions are real and authentic, with true intention to exchange views, and, consequently, the joint reflection, without handling any participant with no room for oppressor or oppressed.

Final Conclusions

Educommunicative practices have been adopted at public schools in Sao Paulo city now for more than 15 with interesting and rich results regarding the development of many behavioural skills. And they are not only pointing to the importance of the knowledge about the communication management for educational objectives but also showing us how this approach can make difference on the results obtained at the end of those processes.

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OPEN UNIVERSITIES AND THE SOCIAL AGENDA OF DISTANCE EDUCATION

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Background to the Study

Modern distance education emerged in the 1960s in response to demands for greater and more equitable access to postsecondary education (Haughey, Evans & Murphy, 2008; Holmberg, 2003; Keegan, 1996; Peters, 2006). Beginning in 1969 in Great Britain, open universities were established around the world with a clear mandate to help eliminate the social and financial barriers to higher education that had effectively limited access to the middle and upper social classes (Peters, 2006). This situation was particularly acute in the developing world and the open universities that were established in countries such as India, Pakistan, Sri Lanka, Indonesia and Thailand have made a significant impact on postsecondary participation rates in those regions (Bates, 2005).

The success of the single mode distance education institutions lent credibility to a mode of delivery that had hitherto been looked on with suspicion and doubt by the traditional educational community. The reputation of distance education had been tarnished by the questionable practices of commercial correspondence schools that became known as “diploma mills” (Reid, 1960). As legitimate distance education institutions gradually established their credibility as providers of quality education, traditional postsecondary institutions began to establish their own distance education programs and by the end of the last century, most universities and colleges in North America had distance education programs of varying sizes. And like the single-mode distance education institutions, the distance education programs in the traditional institutions were driven by a social agenda of access and equity. They were targeted at non-traditional adult learners who, for a variety of social reasons, missed the opportunity to pursue postsecondary education in contrast to the more mainstream postsecondary target population composed mainly of 18-24 year olds directly out of high school

The Emergence of E-Learning

In the late 1990s technology-mediated forms of distance education emerged and, in particular, the use of the Internet as method of delivering education became increasingly popular (Bates, 2001, Collis & Moonen, 2001). This further enhanced the reputation and credibility of distance education because it allowed for much greater and more meaningful interaction

between instructors and students and amongst students. Concurrent with these technological and educational developments were financial pressures on public postsecondary institutions that forced them to look for cost-saving alternatives to deal with increasing demand (Bates & Poole, 2003; Meredith & Burkle, 2008). Many turned their attention to the newly-legitimized forms of technology-supported distance education because it was seen as a way of avoiding the costly construction of new buildings. However, instead of using these technology-supported approaches primarily to reach the non-traditional learner, they were incorporated into on-campus teaching to create what was termed blended learning approaches and more recently has been called e-learning (OECD, 2005). Driven primarily by a functionalist agenda, this form of e-learning gradually began to overshadow the socially-oriented distance education programs. New organizational units emerged in traditional universities to deal with this new form of e-learning, often competing for funds with the distance education units (Bullen, 2006).

Purpose of the Study

With most conventional universities having abandoned any commitment to using distance education to broaden access in favour of increasing the flexibility of on campus students, we wondered if open universities were still championing the social agenda of distance education 50 years after the founding of the UK Open University.

Founding beliefs of ODL institutions differ somewhat. Yet many have some common principles stated in their mission statement, which are summarized by Tait (2008) and Perraton (2000):

1. To help national and economic development –nation building in the wider sense;
2. To respond to increased public demand for education;
3. To widen access to education to new groups of students;
4. To change education in terms of quality and innovation.

The purpose of this exploratory qualitative study is to explore the how select national open universities have responded to the social agenda of distance education as articulated in the key founding principles of the open university movement. We will attempt to understand how these institutions have addressed national development, public demand, access, and quality issues and the extent to which the focus on these foundational principles has shifted since their inception.

Conceptual Framework

Distance education is a highly under-theorized field, especially at the macro-level of defining an institutions mission, plan and agenda. However, Sen (1985) and Nussbaum's work on creating capabilities underpin Tait's framework (2013), about a capabilities approach to defining the mission of open universities. This framework provided a useful point of entry to this study. Raivola's (1985) methodological considerations for comparison in education also

served as an important framework when considering how to compare and analyze different open universities.

Research design

A basic interpretive qualitative study design was used to understand whether and how open universities might be changing their mission in light of changes to national economies, technology access and use, and government policies. The interview schedule consisted of open-ended questions informed by the work of Özdem (2011, 2008, 2013) on the changing role of open and distance teaching universities, and based on current issues that open universities are encountering based in an era of increased IT access.

Sampling and Data Collection

Twenty-one open universities were approached to participate in this study. Geographical diversity was the key principle underlying sample selection. We also attempted to include the largest (in terms of student numbers) open universities around the world as well as some of the smaller institutions. To date, senior administrators from 10 institutions have been interviewed. They are from open universities in Japan, China, Indonesia, Taiwan, Tanzania, South Africa, Spain, Netherlands, United Kingdom, and the West Indies. All interviewees were at the Associate Vice-President level or higher at their institutions (i.e. presidents, vice-chancellors, pro vice chancellors, and rectors).

Four institutions have so far provided background documents or brochures about their institutions. All institutions websites were perused and analyzed for factual data about the institution (e.g. enrolments, reach) and their mission.

All interviewees were given a copy of data that was analyzed about their institutions, and they were given an opportunity to provide feedback about this analysis. This process served as a member check of the interpretation of the data.

Preliminary Results

Initial analysis indicates that open universities are still strongly committed to their original missions to provide open access to a broad range of learners. However, external pressures are providing challenges. In Europe open universities are challenged by economic austerity and national educational policies that are changing the educational landscape in their countries. This includes the growth of online offerings from other institutions who did not historically do so. In Africa, open universities are racing to keep up with growing demand for formal and non-formal education. They are considering different opportunities based on this demand, the growing access points for distance education via ICTs (information and communication technologies). In Asia, the demand for DE courses is growing exponentially. There is also the increased awareness and interest in massive open online courses (MOOCs). However, issues of quality assurance continue to be important as a priority. Comparing institutions, it is notable just how varied the term open is among them and how it has changed since the original founding of most of these open universities. Most open universities leaders were not

concerned about universities, especially from the United States, aggressively trying to expand their educational influence and prominence via online education.

At the time of submission, data collection was still underway with several additional interviews scheduled with open universities in Asia, Europe and Africa. By conference time we hope to have a more complete analysis.

Significance of Study

Open Universities are facing internal pressures from their governments about issues of cost and effectiveness of programs. They are also facing pressures from students about access and quality. As demand for higher education continues to grow globally, open universities have the experience and capacity to expand educational offerings at a greater rate than conventional institutions. Yet issues of mission, planning, and quality will need to be addressed thoughtfully if they are to address these demands effectively. This study identifies challenges and initiatives of open universities in this changing educational landscape.

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THE INFLUENCE OF THE SEX VARIABLE ON HOW PARTICIPANTS IN A MOOC PERCEIVE EMOTIONS

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Introduction

The analysis of how emotions influence the teaching-learning process is an instrument which, in recent years, has helped open new avenues for educational research and has also yielded interesting results. For example, it is suggested that the students' emotional engagement is an essential factor in their learning process (Wosnitza & Volet, 2005). With the advent of new online learning environments, interesting new studies have been published on the subject of emotions and their relation to learning development (Rebollo, García-Pérez, Barragán et al., 2008; Rebollo, García-Pérez, Buzón & Vega, 2014).

Although still incipient, the increase in the number of massive open online courses (also known as MOOCs) has also contributed to a line of research where the focus is on analysing how emotions influence the motivation and the learning outcomes of the people who take part in those courses. There are relatively frequent analyses of *affordance* and of the opportunities derived from it in the field of online learning (John & Sutherland, 2005).

One notable example of the analysis of emotions or *affordance* in MOOCs is Cheng's exploratory study of the emotional potentiality of a MOOC (2014). The author's conclusion was that emotions such as excitement and a desire to help other students play an essential role in the MOOC participants' learning process, which was defined as constructivist and focused on the interaction between the participants.

We should also highlight a study by Koutropoulos, Gallagher, Abajian et al. (2012) which set out to analyse the emotive vocabulary in a MOOC. More specifically, the study examined the emotive vocabulary in the MOOC's discussion forums, with a focus on words with an implicitly emotional meaning ("happy", "sad"...) or referring to emotional contexts (e. g. "I was not able to"). One of the main goals was to determine whether that emotive vocabulary could serve as a tool to predict the students' active and continued participation in the MOOC (in other words, not quitting the MOOC).

In line with this area of research, which is centred around the influence of emotions on different aspects of the learning process in MOOCs (e. g. active and continued participation), we are presenting a study about the perception of emotions during a MOOC organised in

2014 at the University of the Basque Country. The course structure was based on the cooperation between the participants through social networks.

Methodology and sample

The main goal of this study is to describe the variety of emotions felt by participants over the course of a MOOC. More specifically, we intend to carry out an emotional assessment of what the MOOC students felt. The pillar of this approach will be an independent variable: the participants' sex. In other words, we will analyse whether being a male or a female student has any influence on the emotional dynamics of learning in the context of a MOOC.

For the statistical analysis of the data we used version 22 of the SPSS software. Data were collected by means of a Likert-type questionnaire based on a validated model by Rebollo, García-Pérez, Buzón and Vega (2014), which was adapted to the context of a MOOC. The questionnaire was completed by the participants once the MOOC had finished and included 10 items divided into three categories depending on the type of emotion under discussion: 5 items were used to measure positive emotions (pride, satisfaction, enthusiasm, confidence and relief) and a further 5 items were used to measure negative emotions (insecurity, stress, worry, irritability and frustration).

Table 1: Summary of items in the questionnaire, as adapted by Rebollo-Catalán, García-Pérez, Buzón-García and Vega-Caro (2014)

Positive emotions	
Pride	"I am proud of how I have done in the MOOC."
Satisfaction	"I am satisfied that I completed the coursework correctly and on time."
Enthusiasm	"Doing this MOOC has encouraged me to learn more about the topics discussed."
Confidence	"I am confident that I have completed the MOOC correctly."
Relief	"I will feel relieved once the MOOC finishes."
Negative emotions	
Insecurity	"Doing the MOOC makes me feel insecure."
Stress	"I have felt stressed over the course of the MOOC."
Worry	"I have felt worried while doing the coursework and other activities in connection with the MOOC."
Irritability	"I have felt irritated over the course of the MOOC."
Frustration	"I have felt frustrated doing the MOOC."

The MOOC's title was "EHUMOOOC 2014. PLEs, MOOCs and digital content creation" (2nd edition). It took place over six weeks and a distinctive element in the course design was cooperation between the participants. The teachers in charge of the MOOC prepared the topics (see Table 2), a document with a maximum of 400 characters, 4-5 videos of between 3 and 5 minutes, and the activities that each participant subsequently had to share with their peers and teachers to receive feedback from them. Interaction between the participants was done through social networks. Purpose-specific social networks were offered within the framework of the MOOC on the Metauniversidad platform. An example was the NING channel, specifically created for the MOOC. However, participants were also at liberty to use other social networks with which they may be more familiar, such as Twitter, Facebook, Youtube or LinkedIn.

Table 2: Topics covered in the MOOC (classified by weeks)

Weeks	Topics
Week 1	Web 2.0 and education
Week 2	The mobile learning tsunami
Week 3	Open educational resources (OER)
Week 4	Digital content creation
Week 5	Personal learning environments
Week 6	The challenge of MOOCs

The study sample included the 392 people (264 women and 128 men) who registered for and completed the MOOC.

Results

We analysed the results from the scale we used (the adapted scale by Rebollo, García-Pérez, Buzón & Vega, 2014) and below we show the results following the same order of positive and negative emotions and the influence of the sex variable on how they were perceived.

As regards the emotion “pride”, there were statistically significant differences (0.001) between the men’s and women’s replies. We found that 87.87% of women gave an affirmative answer to the item “I am proud of how I have done in the MOOC”, with 45.45% indicating they felt “quite” proud and 42.42% “very” proud. This contrasts with 31.25% of men who felt “quite” proud and 43.75% who felt “very” proud. Differences in answers from male and female respondents were particularly evident in those persons who said they felt “somewhat” proud (25% of men and only 12.12% women) or “quite” proud (45.45% of women and 31.25% of men). In the case of those who felt very proud (i.e. the “very” answer), there was not a marked difference between men (43.75%) and women (42.42%). In general, most respondents (both women and men) answered this item affirmatively, but it is worth mentioning that women scored more frequently on “quite” and men on “somewhat”, noting that there were no major differences in the “very” answer.

As regards their perception in terms of their satisfaction with how they did the coursework (item “I am satisfied that I completed the coursework correctly and on time”), women scored more frequently on “not at all” (3.03%) and “very” (45.4%) than men (0% on “not at all” and 31.25% on “very”). On the other hand, more men than women chose the answers “somewhat” (18.75% men, 12.12% women) and “quite” (50% men, 39.39% women). These figures result in statistically significant differences (0.005) in connection with the answers about the degree of satisfaction. For example, in connection with the “satisfaction” emotion, women are polarised: they either feel “not at all” or “very” satisfied. Men, however, are more neutral: the majority said they were “somewhat” or “quite” satisfied.

This does not happen in the case of the “enthusiasm” emotion, where no statistically significant differences were detected. As regards the item “Doing this MOOC has encouraged me to learn more about the topics discussed”, which is directly linked to enthusiasm, we find that more women answered affirmatively: 72.7% gave a “quite” or “very” answer, compared

with 62.5% of men. This would suggest that men have felt less enthusiastic about the MOOC, as 37.5% felt “little” or “not at all” enthusiastic.

The trend we saw earlier in connection with satisfaction continues with the “confidence” emotion: not only are there statistically significant differences (0.002), but women appear to be more polarised than men. More men (18.75%) than women (9.09%) gave a “somewhat” answer, but more women answered “not at all” (6.06%, compared with 0% of men) and “very” (30.30%, compared with 25% of men). No major differences were detected in connection with the “quite” answer (chosen by 56.25% of men and 54.54% of women).

As regards relief, the last positive emotion (reflected in the item “I will feel relieved once the MOOC finishes”), the answers followed a similar pattern. Women chose more frequently the “not at all” answer (6.06% of women, compared with 0% of men) and the “very” answer (66.66% of women, compared with 31.25% of men), whereas more men chose the “somewhat” (31.25% of men, compared with 15.15% of women) and “quite” answers (37.5% of men, compared with 12.12% of women). This means that, aside from a repetition of statistically significant differences (0.000), we continue to see a polarisation in the female participants’ positive emotional experiences and attitudes to the learning process in the MOOC, whereas male participants had a more neutral experience in terms of the positive emotions.

The analysis of the emotions that we have identified as negative (insecurity, stress, worry, irritability and frustration) yielded results which confirm the statistically significant differences between men and women.

The first negative emotion we analysed was insecurity. This was gauged by means of the item “Doing the MOOC makes me feel insecure”. As we indicated earlier, significant differences (0.001) were detected based on the sex variable. Male participants showed less insecurity than women, but it must be pointed out that no participants chose the “very” answer for this item. A majority of men (62.5%) said that they felt “not at all” insecure about the MOOC, compared with 45.45% of women. Furthermore, 36.36% of women and 31.25% of men said they felt “somewhat” insecure, whereas 6.25% of men and 18.18% of women said they felt “very” insecure. In general, it seems that the majority of the participants (whether women or men) did not feel insecure about the MOOC.

This trend in the answers given by both male and female participants continues in the stress item, where men chose “not at all” more frequently than women, whereas women chose “somewhat” and “quite” more often than men. There are, therefore, statistically significant differences (0.000) in the results from the point of view of the answers given by men and women. We found that 43.75% of men (as opposed to 18.18% of women) chose the answer “not at all”, 12.12% of women (as opposed to 6.25% of men) chose “very”, and 39.39% of women (as opposed to 18.75% of men) chose “somewhat”. Amongst those who felt “quite” stressed, there are similar percentages of men (31.25%) and women (30.30%). This would suggest that men in general did not feel stressed by the MOOC, whereas women did feel “somewhat” or “quite” stressed.

There were also significant differences (0.000) in the answers regarding the “worry” emotion (item “I have felt worried while doing the coursework and other activities in connection with the MOOC”): more women expressed they felt “very” worried whilst doing the MOOC coursework, whereas most men indicated they felt only “somewhat” worried. More specifically, 62.5% of men felt “somewhat” worried, 6.25% “not at all” worried and 31.25% “quite” worried. As regards women however, 48.485% felt “somewhat” worried, with 33.335% feeling “quite” worried and 6.06% “not at all” worried. The biggest difference is in respondents who said they felt “very” worried: 12.12% of the women and 0% of the men.

On the irritability items, the polarisation trend that we have seen in the answers from female respondents continues. Once again, statistically significant differences (80.013) exist between men and women, as more men said the MOOC made them feel “somewhat” (62.5%) or “quite” (15.15%) irritable. Women, however, leant more towards the “not at all” (30.30%) and “very” (3.30%) answers. The majority of participants in general (62.5% of men and 51.51% of women) indicated that the MOOC made them feel “somewhat” irritable. We must also highlight that 3.30% of women felt “very” irritable by the MOOC, but no men felt irritability to that degree.

Women were also polarised in their answers about the last emotion: frustration (item “I have felt frustrated doing the MOOC”). Most women opted for the more extreme answers, as opposed to men’s more moderate choices. In connection with the feelings of frustration elicited by the MOOC, two aspects stand out.

Firstly, the participants in general (whether men or women) did not feel frustrated by the MOOC. We find evidence of this in the fact that 85.85% of women and 72.25% of men expressed they were “not at all” or “somewhat” frustrated, as opposed to 12.125% of women and 18.75% of men who said they felt “quite” or “very” frustrated.

Secondly, it is evident that, notwithstanding the above, a higher percentage of men (18.75%) than women (12.12%) felt “somewhat” frustrated by the MOOC, but only women felt “very” frustrated (3.03% of women and 0% of men chose the “very” answer).

Conclusion

A MOOC based on cooperation requires direct and continued involvement from the participants. This, in turn, implies an emotionally active experience, which, judging from the results in this study, can be described as more positive than negative. In general, the participants perceived a positive emotional development throughout the learning process in the MOOC. The emotions defined as positive (pride, satisfaction, enthusiasm, confidence and relief) have been assessed as positive or very positive by all participants (both women and men). On the other hand, the emotions defined as negative (insecurity, stress, worry, irritability and frustration) have been assessed by the participants as negative. So the first conclusion that may be drawn from this is that doing a cooperation-based MOOC appears to be an emotionally positive experience for the participants.

The way participants gauge their emotions, however, changes depending on whether the participant is a man or a woman. It is worth mentioning that, in all cases, there are results with significant differences between men's and women's answers, except in the "enthusiasm" item, where men and women score similarly on all the answer options. Based on this, our second conclusion would be that, despite the emotionally positive experience, there are different degrees of positive or negative emotions amongst both men and women. We have been able to establish that women's emotional experience, whether positive or negative, is much more polarised than that of men, which we would describe as "neutral" or "moderate". This polarisation is particularly evident in some of the positive emotions (satisfaction, confidence and relief), which also reveal significant differences with men's perceptions. That distinctive polarisation amongst female participants can also be found in two of the emotions defined as negative: irritability and frustration. We can therefore conclude that the sex variable appears to have a significant influence on the emotions elicited by the learning process of a MOOC. Bearing that in mind, it may be interesting to conduct further research in order to analyse what causes those differences. This aspect, as well as others such as learning outcomes and the different types of course design for a MOOC, appears to be a promising area for future educational research.

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"I AM DIFFERENT FROM OTHER WOMEN IN THE WORLD" THE EXPERIENCES OF SAUDI WOMEN STUDYING ONLINE IN INTERNATIONAL MASTER PROGRAMMES

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Abstract

This paper presents findings from a qualitative study that investigated seven female Saudi Arabian students of the University of Liverpool's online Masters programmes. Qualitative, first-person research methods and hermeneutic phenomenology were chosen for the analysis and interpretation of transcripts (Langeveld, 1983; van Manen, 1997; Creswell, 2007; Roth, 2012). The principles of cultural anthropology (Hall & du Gay, 1996; Hannerz, 1992; Lull, 2001; Coleman, 2010) were used to take a snapshot of the interviewees' particular world to provide an overview of the Saudi culture where the role of women is at the centre of academic, political, religious and social debate. These findings reflect the participants' everyday lives, identities, values and beliefs, presented in a self-reflective, personal 'life-world' story of one single Saudi woman. The findings demonstrate that the primary motivators in choosing online international education to further studies are existing limitations of travelling to a university campus and customary gender-segregated education in Saudi Arabia. As a contrast, international online education offers the opportunity to gain up-to-date research-based knowledge in their chosen profession, learning critical thinking and problem solving skills and being given a chance to communicate with male and female students from different cultures.

Introduction

Education in The Kingdom of Saudi Arabia (hereafter referred to as KSA) is segregated in all levels. The education system is controlled by religious authorities that restrict women's access to education and limit their participation in certain professions. Therefore, women's choices are limited to certain professions or employment. They are not allowed to study engineering, journalism, pharmacy or architecture, as these professions are traditionally considered male activities (Cordesman, 2003). Women study mainly in the fields of health care, education, and public administration (AlMunajjed, 1997; Baki, 2004).

This article will present the particular 'life-world' of seven female, emancipated Saudi students who are eager to learn and actively participate to change the status-quo of women in the Saudi society by pursuing alternative higher education. Online learning lifts the restrictions on their physical mobility and alleviates their forced segregation in the Saudi society. The life of a

Saudi female student, studying in an online, Western European university, uncovers new dimensions in her experience with new paradigms to help find her own way to succeed.

Women and gender-based segregation in KSA

In the Arab world, The Kingdom of Saudi Arabia (hereafter referred to as KSA) is one of the most conservative Muslim countries, considered the keeper of the Islamic religion (Baki, 2004). Islamic studies are a core component of the educational curricula, in which male and female students learn their rights, obligations and duties (Denman & Hilal, 2011; Jamjoom, 2010). This religious education treats genders differently due to the different roles men and women assume in the Saudi society: boys are traditionally taught about male activities, girls about their role as mothers and housewives (Baki, 2004).

The traditional interpretation of the role of women in the Saudi society is based on the *Qur'an*, and the *Wahabi* interpretation of Islam, which is one of the most orthodox religious authorities within the Islamic religion. "The *Qur'an* gave women equal but not identical rights with men on personal, civil, social and political levels [...] and warned that the mixing of sexes could lead to seduction and evil consequences that might follow". (Baki, 2004, p.2) In terms of clothing, the *Wahabi* interpretation calls for modest clothing for women including covering the face. The *Qur'an* also mentions modest clothing of women; although there is no indication about covering the face (Yamani, 1996; Almunajed, 1997, Baki, 2004).

Although today the Saudi educational system offers female education from primary to doctoral level, the restrictions in mobility create a significant obstacle for women to freely access higher education, since in order to attend a class on campus or go to a public (segregated) library, they need to employ a chauffeur or ask a close male family member to drive them to and from the institution (Baki, 2004).

Online Education in KSA

As the educational system experiences change, the position of the Saudi Ministry of Education is ambiguous in relation to international online programmes: it does not fully accept qualifications from purely online programmes due to concerns about the quality of the online programme (Hamdan, 2014). On the one hand, KSA promotes the development of online or blended learning methods and English teaching in order to sponsor the education of skilled Saudi citizens with English proficiency, on the other hand it also recognises the culturally invasive power of low cost mass media (internet, satellite television, social media) and that native English teachers in international programmes may pose cultural challenges for Saudi students due to their different ways of thinking and interacting (Moores-Abdool, Yahya & Unzueta, 2009; Onsman, 2011).

One of the challenges in implementing online or blended learning is that Saudi public universities are used to the traditional didactic, lecture-based, teacher-centred education. Their curricula are often out-dated or irrelevant to students' career paths. In addition, they continue to use memorization and passive learning practices (Alebaikan & Troudi, 2010;

Hamdan, 2014). Hamdan's study (2014, p.312.) describes that in the Saudi school system, knowledge and truth are fixed concepts and "what is taught in school is unquestionable", which does not facilitate the development of critical thinking skills or the appreciation of diversity. As opposed to this, online learners in KSA have free access to educational resources, online libraries, online forums that facilitate intercultural communication between students from all over the world and with the other gender as well.

"This unprecedented openness to new educational resources and cultural perspectives is leading KSA's younger generations to become less traditional and strict in their views" (Hamdan, 2014, p.310).

Methodology

The findings are part of a wider research project that focuses on the online learning experience of Saudi students and follows phenomenological principles (van Manen, 1997; Crotty, 1998; Creswell, 2007; Mason, 2012; Roth, 2012) in the research design. For this particular article, the in-depth, semi-structured interviews with seven Saudi female students were used to enable the investigation of their 'life-world' (Langeveld, 1967, 1983).

The interviewees were all enrolled in or graduated from the online master programmes of the University of Liverpool delivered by Laureate Online Education. The selected students were all Saudi citizens and had at least one year of learning experience in the online programme. A group of female students was selected, with a range of passing grades, to understand their views of learning online in a global environment. Participants were between 25 and 49 years of age; their religion is Islam. Most of them have had some educational experience in America or Western European countries; one has also experienced online education in a US university.

The interview structure focused on three main topics: cultural values at home, online learning experience (MA level) and face-to-face learning experience in the Saudi Arabian segregated higher educational system (BA level). The interview protocol covered a set of questions that invited students to reflect upon their culture and online learning challenges.

"Women don't drive here, so we use drivers or a male family member has to drive us" (Student 1, 3, 4, 5, 6, 7)

"Women don't drive here, so we use drivers or a male family member has to drive us. Women here usually have three different ways to find someone to drive them. Either it is one of the male family members, like brother, husband, father or nephew who can drive or they have their private drivers with contract. Private drivers are usually from Indonesia, India, Pakistan, Bangladesh and the Philippines." (Student 4)

"The doors of the University are locked once you are in." (Student 4)

"When I studied on campus during my graduate studies, my dad used to drive me to the University. My first class started at 7am. He could not come to pick me up before 5 in the afternoon, due to his work commitments. I was not allowed to go out before the end of the academic day, even if I had no classes in between. The doors of the University are locked once you are in. At the beginning this was very strange for me, but then I got used to it." (Student 4)

"I am different than other women in the world" (Student 3)

"I am different than other women in the world. I'm getting knowledge, I join companies to work but still I am treated differently and I have fewer rights than other women. The Saudi culture is very strict and conservative; a religion-based culture. It is a man-dominant society. There are a lot of things that are not allowed for women.

I don't have the same opportunities and I am not allowed to be myself, because the culture is not supporting women. When making decisions, a woman has to check first how it is acceptable and permitted by the religion. It does not matter how educated, broad-minded and intelligent you are, as a female." (Student 3)

"It's a struggle to work as a woman" (Student 4)

"I couldn't manage male staff: they cannot tolerate having a woman as a supervisor. It's a struggle to prove myself because I have to show constantly that women can do as much as men do. Even if professionals accepted this fact and they worked with me as an equal, it's difficult for the parents. Sometimes they come and say: 'Can we talk to a man? Do you have a man here that we can talk with?' They don't want to feel that a woman gives them the information, and makes the decision for them. Usually they are the decision makers, without the help of a woman. It is difficult to deal with them, as sometimes we have very conservative and religious parents.

I learnt that no matter what my intentions are, the parents' opinion is more important. I have to be conservative as far as my appearance and behaviour." (Student 1)

"Now I am prepared that when I talk to a father, I have to ask a staff member to witness the conversation, change the way I sit, my posture, my body language, my tone of voice, even the way I think. It is so difficult... I am trying my best to behave differently, because I know this is the only way that I can provide good care to my patients and to their parents. I don't mind doing the

extra miles just to make them feel comfortable, safe and secured with me."
(Student 4)

"I don't feel bad when I cover my hair" (Student 5)

"I feel very good and proud of being a Muslim woman, wearing hijab, because I feel protected and I know I gain benefits for my next life. If you see a man without hair, you can accept his face and you don't care about the hair. But if you asked a man, what is the first thing he looks at a woman, he would say: 'if the woman doesn't have hair, I don't look at her'. Our God asks us to cover our hair...in order to protect us." (Student 5)

"We believe that covering the hair will not make us very appealing to men and that we have a very conservative religion that we protect. We always cover the hair and wear conservative clothing, no arm can be shown, no legs can be shown, so it becomes less appealing to men." (Student 1)

"This is our belief about cover and this is how you protect yourself and you protect also men, from not seeing you actually." (Student 1 and Student 5)

"I could not communicate with male students face-to-face, but I could use network communication" (Student 5)

"During my bachelor studies in Saudi Arabia male students were separated in other classes. I could not communicate with them face-to-face, but I could use network communication. I used to communicate with them during my studies. This way of communication is not so different than communicating with men in the online master programme: you don't see them, but you can see them interact by exchanging messages and words." (Student 5)

"I treated the online classroom, as if there was no actual communication with men, there were only responses on the subject. I read their answers for the discussion question and I wrote a response, but usually there were no emails, there was no further connection." (Student 7)

"There were situations when there was disagreement in the online class, but it wasn't difficult for me to deal with it. I just posted my opinion and discussed it with them back and forth. Whenever I discussed it, of course, we never talked outside the class because we're not at that level of relation." (Student 5)

"I didn't feel connected with online students" (Student 4)

"I didn't have close relationship with my classmates. I only imagined them. I didn't see them in real life." (Student 5)

"The time I spent online was enough for my own learning, but did not increase my relationship with my classmates." (Student 1)

"Even if we had the opportunity to exchange emails or occasionally called each other, still the face-to-face relation was not there, and I always felt there was something missing. I read their posts and got the idea but their expressions and feelings were missing." (Student 4)

"In the online class you were given materials and all depended on you. In contrast, in the face-to-face university I was more dependent on the instructor and not on myself, because I could ask him on the spot." (Student 3)

I wanted to change the way I was educated: I wanted to open my mind to other cultures, experience research-based learning and increase my knowledge" (Student 1, 2, 3, 4)

"In Saudi Arabia professors have formal relationship with students and sometimes I avoided them because I didn't like their way of teaching." (Student 5)

"Students were not dependent on themselves, everything was ready for them. I remember that when I had a Biology class during my BA studies, the professor came with notes that were ready for us, we read them, completed the assignment, passed the exam and that was it. There was nothing about teaching students how to use their brains, search in the library for extra books and articles. This is exactly what is happening in other Universities outside Saudi Arabia. I am used to the American style of education and the Arabic education wouldn't be satisfactory for me. This is why I wanted to change the way I was educated." (Student 1, 2, 4)

"I chose the online master programme of the University of Liverpool because I wanted to open my mind to other cultures, experience research-based learning and increase my knowledge." (Student 1, 2, 3, 4)

"Online learning gave me the opportunity to meet people from different cultures, with different believes and knowledge." (Student 3)

In the online class we were free to speak" (Student 4)

"I had experience with other online courses at an American online university. At the time there were lots of political issues between the Middle East and the States after 9/11 and I felt discriminated in the class. I was the only student from the Middle East and the professors were really against me. They were irrational and very critical about my postings, so I had to quit. My experience with the University of Liverpool is totally different. I really liked studying here

and I've recommended the University for many people. There was respect towards students and between students. No one commented on anything that might hurt or make others uncomfortable in the class. In my culture, usually we don't discuss things openly, but in the online classes we were free to speak. No one joked about whatever I posted or said." (Student 4)

"I didn't feel I was judged by my background or my religion. It was very easy and comfortable to express my thoughts on religion, education and my cultural background. It was a respectful environment." (Student 1)

"That is something really good about Liverpool." (Student 4)

Discussion

The constructed "story" of a Saudi woman provides a snapshot of the transforming reality of female Saudi students. It portrays the everyday difficulties of travelling back and forth to the campus of the university or to a public library due to customary limitations on women's mobility. It also demonstrates how Saudi women view gender segregation, the essence of modest clothing or covering their hair, and also sheds light on culturally acceptable ways of communicating with the other gender. The struggle how women learn to communicate with men in order to be accepted and appreciated in their own cultural milieu is evident from their recounts. In the world of Saudi women, restrictions are completely acceptable and justified, as they were created to protect them. Yet, the interviewees are evidently ambitious Saudi women, who are aware of how differently other women are treated in other parts of the world. They have similar career aspirations and dreams of self-fulfilment, which motivate them to look for different ways of learning.

Online education provides a way to lift cultural limitations. Female students enjoy that they are free to talk and communicate with male students within the classroom, although most of them would not initiate further discussion with them outside of the class. This alternative was commonly accepted by the participants. They felt that online learning not only gives them a chance to increase their knowledge about different cultures, but also helps them to use different methods of learning in order to develop critical thinking skills and adapt new problem solving methods. This is significantly different from using passive learning or memorization techniques practiced in the local universities within the constraints of segregated education. Hamdan (2014) and Moores-Abdool et al. (2009) and Al-Fahad (2010) also confirm that Saudi female students appreciate international online or blended education because of these features.

Conclusion

The internationalization of education is a widespread and irreversible process generated by globalization. (Al-Fahad, 2010, Hamdan, 2014) It has led to the emergence of young female, professionals within KSA who are hungry for social recognition in their cultural milieu, and are willing to take an active role in the socio-cultural and political changes, protesting against the restrictions imposed on them within their own country. The surrounding Muslim society insists on the practice of gender segregation; women's appearance in the male sphere is deemed provocative and offensive and women are restricted to "spend most of their lives in veil and in the four walls of their house". (Syed, 2010, p.151) There are still relatively few studies conducted on the effects of international online education that enters 'their house' and at the same time, opens up virtually the whole world at least for the duration of their studies. The present paper highlights that more research is needed in this area and also suggests that policy makers in KSA should take action in order to create more clarity in what is considered a role model for today's women in KSA. The serious potential of highly educated women, who are just as skilled as their male colleagues, should also be recognized in the Saudi labour market

The findings of this paper demonstrated the awareness of female Saudi students of their ambiguous role as women in the Saudi society: on the one hand they are trying to fulfil the cultural expectations of the conservative Saudi society, whereas on the other hand, they are eager to take an active role in their education and career choices. This paper demonstrated culture and country specific motivational factors, leading them to look for alternative learning methods and it also shed light on the limitations that determine their everyday lives and learning experiences. These women choose online learning in international programmes because it eliminates cultural and physical boundaries, opens a new horizon, allows free communication between male and female students from different cultures and also provides a way to gain up-to-date knowledge in specific professions.

The ambitious goal of the KSA to elevate the international status quo of its higher education continuously opens up the debate on gender-based segregation, which still remains unresolved and contested (Prokop, 2003; Baki, 2004; Osman, 2011). In the course of their emancipation, the female Saudi society has to compete with foreigners in the labour market, having up-to-date knowledge and excellent English language skills, and also, with the Saudi male population. They have to face conservative political forces that insist on the idea of gender segregation in order to secure employment opportunities for the members of the male society (Doumato, 1992; Prokop, 2003). Therefore, the question remains: how are these ambitious and skilled female students going to find suitable jobs (given their degrees) in the male-dominant Saudi society, where the same limitations that forced them to choose online learning in international programmes as opposed to in-country face-to-face education still exist and determine the everyday life of a working woman? Will they ever be treated just like their male colleagues, i.e. as equals? This study does not aim to answer this rhetorical question, as the educational, religious and socio-political debates around the role of women in

the Saudi society are yet to crystallize. It does, however, intend to raise awareness regarding the ambiguous situation of educated Saudi women: as students they learn the way "*other women*" (Student 4) learn in Western societies, but their life is connected to a socio-cultural milieu that resists giving them equal human rights.

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A CASE STUDY OF POLYSYNCHRONOUS LEARNING IN UNIVERSITY BIOSCIENCE EDUCATION

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Introduction

Contemporary university students are engaging in new ways with teachers, peers and content in and out of class capitalizing on the affordances of mobile devices and new kinds of synchronous and asynchronous online learning tools. The multiple ever-present communication streams that are emerging through these new tools and devices are leading to learning scenarios incorporating interaction patterns that have the potential to transform the learning process. The term 'polysynchronous learning' has been co-opted and adapted to capture these new learning scenarios. This paper draws on the findings from a case study of polysynchronous learning within a university Histology subject in order to illustrate some of the key aspects of these scenarios and the ways in which the student learning experience is changing as a result.

Polysynchronous learning

Synchronous and asynchronous learning

Traditionally interactions between learners and teachers or between learners and learners have occurred either synchronously (participants communicating at the same time), or asynchronously (communication occurring over a period of elapsed time). For example, learning designs in face to face settings have traditionally relied primarily on synchronous verbal communication between students and teachers and between students and their peers in conjunction with independent engagement with subject content and learning resources outside of class time. In online settings, learning designs have tended to focus primarily on asynchronous participation by students (Abrami et al., 2011), through access to online resources and through the use of asynchronous discussion forums to engage with peers and teachers. Researchers and learning design scholars have tended to treat synchronous and asynchronous participation as an either-or proposition. Bernard et al. (2009), for example, has published a highly cited meta-analysis of studies comparing the value of each modality.

More recent developments, however, have led to a questioning of this notion of synchronous or asynchronous communication being a fixed attribute of face to face learning on the one hand or online learning on the other. For example, in face to face contexts the availability of asynchronous discussion forums and social media tools has introduced the possibility of a separate asynchronous communication stream that allows in class discussions to continue

after the conclusion of face to face classes and allows communication and collaboration between students while engaging with learning resources outside of class. In online contexts it is becoming clear that there are potential benefits from synchronous real-time communication alongside asynchronous communication. Real-time synchronous communication can help students to develop the professional communication and collaboration capabilities expected within the modern workplace and to undertake certain kinds of cooperative learning activities more easily. Rapid synchronous exchanges of dialogue, and synchronous sharing of visual material can allow a depth of communication that generally doesn't occur in a purely asynchronous context. Web conferencing systems in particular (e.g. Adobe Connect or Blackboard Collaborate) have made synchronous communication and resource sharing more feasible for online students.

In addition to the way in which the introduction of asynchronous options within face to face contexts and synchronous options within online contexts, has challenged existing assumptions about the learning process in these contexts, the delineation between synchronous or asynchronous is becoming less clear. The distinction between synchronous and asynchronous modality is becoming complicated by i) the creation of digital interaction 'footprints' through recording of synchronous audiovisual presentations and chat logs (see Wexelblat & Maes, 1999), which can be a hub for ongoing asynchronous engagement, ii) the idea that instant responses to asynchronous text chat postings illustrates a third modality, which Garcia and Baker Jacobs (1999) refer to as quasi-synchronous, and iii) the ubiquitous availability of mobile devices which turn asynchronous discussion into quasi-synchronous or synchronous discussion by increasing the likelihood of an instant response.

Student interaction and engagement

In exploring the ways in which synchronous and asynchronous learning experiences can be integrated it is valuable to consider the different kinds of interaction or engagement that occur in a typical learning scenario. In this context, Moore's (1989) categorisation of interaction provides a well-accepted framework for understanding and exploring student engagement in both face to face and online settings. Moore (1989) describes three categories of interaction, learner-instructor, learner-learner and learner-content. In face to face learning contexts, for example, learner-instructor and learner-learner interaction would occur synchronously through verbal communication, while learner-content interaction would occur both synchronously in class and in follow up asynchronous private study. In online learning contexts, learner-teacher and learner-learner interaction would normally occur asynchronously through, for example, a discussion forum, while learner-content interaction might occur asynchronously through engagement with online learning resources. As discussed above, however, recent developments, are questioning the rigid association of synchronous communication with face to face contexts and asynchronous communication with online contexts.

Additionally, the gradual introduction of blended learning options where students undertake some face to face and some online learning activities is also challenging traditional notions of

student interaction and engagement. In particular the need to cater for the situation where some students are physically present, some students participate synchronously from a remote location, while other students participate asynchronously at a later time, is leading to new thinking about ways of blending synchronous and asynchronous learning.

The other key change that is occurring as combinations of asynchronous and synchronous interaction are introduced within face to face, online and blended learning contexts is the introduction of multiple streams of communication. In traditional face to face contexts there is a single stream of verbal communication which is shared by all students and the teacher, and consequently in large classes there is little opportunity for active student participation in the discussion by virtue of the minimal time available to each student within this audio stream. The introduction of one or more streams of asynchronous or quasi-synchronous discussion alongside the main audio stream provides students with the opportunity for much greater participation and engagement with peers and teachers.

Polysynchronous learning defined

The term polysynchronous learning has been used to capture the distinct type of learning experience afforded by the emerging learning scenarios described above. Dalgarno (2014, p.4) defines polysynchronous learning as “the integration of learner-learner, learner-content and learner-teacher interaction through a blending of multiple channels of face to face, asynchronous online and synchronous online communication”. Figure 1 helps to illustrate the way in which polysynchronous learning differs from traditional face to face and online learning by representing the differences in patterns of interaction across modalities in face to face, traditional online and polysynchronous learning environments.

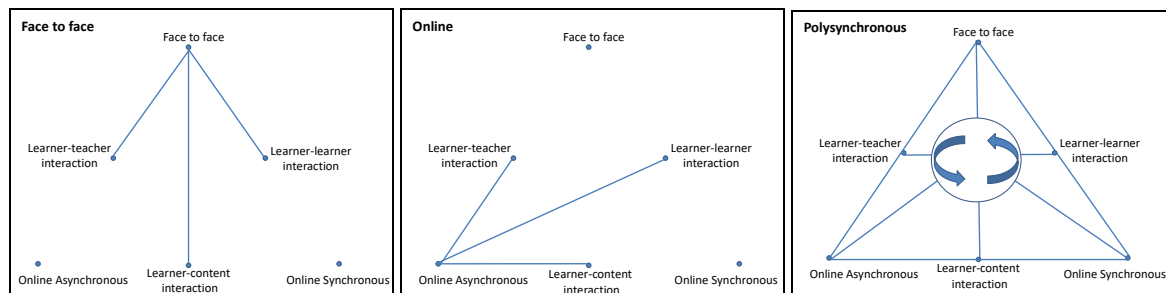


Figure 1. Interaction patterns in Face-to-face, Traditional online and Polysynchronous learning environments

Methods

Background

In the study, ‘Blended synchronicity: Uniting on-campus and distributed learners using media-rich real-time collaboration tools’ (an Australian Office of Learning and Teaching Innovation and Development Grant funded project) seven case studies involving blended learning designs were explored (see Bower et al., 2014). The study explored blended learning designs using video conferencing, web conferencing and 3D virtual worlds. The particular case study described here occurred within a 2nd year university histology subject within a

medical science course in a regional university within Australia. The lesson used Adobe Connect to bring together 12 on-campus students in a computer laboratory and 11 distance education students participating from off-campus locations to perform an interactive review of material for an upcoming exam. The key intended learning outcome during the lesson was the ability to apply an understanding of normal vertebrate tissue structure in the context of histology microscopic image analysis.

Data collection

The face to face learning activities during the lesson were video recorded as were the online activities within the Adobe Connect session. This allowed student interaction patterns to be analysed after the completion of the lesson. Student reflections on the lesson were gathered through a questionnaire completed by 10 students present on campus and 3 students participating remotely. The questionnaire included Likert scale items asking students questions about the degree to which the lesson allowed them to effectively interact with local and remote peers and share resources and about their perceptions about the learning experience along with open ended questions allowing students to comment on aspects of the lesson. The 12 on-campus students participated in a focus group interview following the lesson and all remote students also participated in a focus group interview two weeks later when they were on campus for a residential school. The teacher was also interviewed before and after the lesson. Recordings of student activity in class and online were analysed in order to identify patterns of student behaviour as well as being used to cross-check and verify themes emerging through qualitative analysis of the students' open ended questionnaire responses and comments during focus group interviews. Identified patterns of behaviour and emergent themes were then verified by other members of the research team in order to avoid researcher bias.

Lesson design and delivery

During the first part of the lesson, the teacher, wearing a microphone to allow her speech to be audible to remote students through Connect, presented a series of multiple-choice and short-answer questions. Students (on campus and remote) answered the questions using the Connect student-response (polling) tools. Summaries of student responses were presented graphically, and the teacher explained why each answer was correct or incorrect. Students asked clarifying questions either verbally (on-campus students) or using the text chat tool in Connect (remote students). During the second part of the lesson, students were grouped in pairs and asked to complete microscopic tissue image identification and labelling tasks in breakout rooms within Connect. Group members reported back at the end of each activity and the teacher supplied feedback and clarification. The face-to-face classroom view and the remote student view are shown in Figure 2 below.

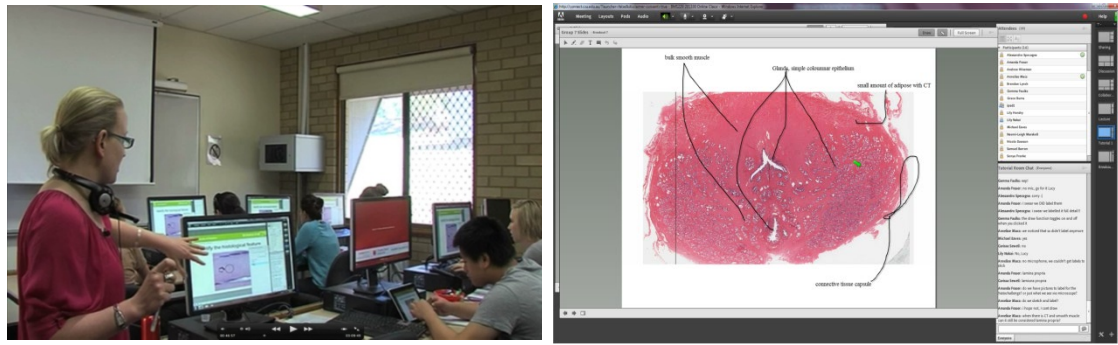


Figure 2. Face-to-face classroom view (left) and remote student view (right)

Results

The majority of face-to-face and remote students responded positively to all items on the questionnaire. For example, all 13 respondents agreed with the statement on the questionnaire “I was able to communicate verbally in an effective manner with people in the face-to-face class” and 11 out of 13 respondents agreed with the statement “I was able to communicate verbally in an effective manner with people who participated remotely”, with one student disagreeing and one neutral. All 13 respondents agreed that they were able to “effectively share visual artefacts with others”, “jointly create, edit, and share material with others”, and “effectively indicate my status to others”. Similarly, all 13 respondents agreed that they felt present with “people who were participating remotely” and with “people who were in the same room as the teacher”. Finally 11 out of 13 respondents agreed that “the collaborative technology provided clear and accurate representation of information and people” with the remaining two students being neutral.

In explaining why they were so positive about the lesson, face to face students during the focus group interview highlighted the additional engagement with content that occurred through the use of the polling tool and the additional opportunity to ask questions and participate in discussion that occurred through the use of the text chat stream. These perspectives are exemplified by the following student comments:

This lesson is so much more engaging than your average lecture or tutorial. I find personally I'm more attentive, and the active participation components help the information to sink in more easily.

It's a better way to ask questions as well, you know you take one of our normal lectures and if you have a question, there's usually so many people in that lecture theatre that you kind of have to wait until you go home and post it on the forum, and you have to wait another 3 days from the lecture for someone to answer it.

Remote students commented on the similarities and differences in the learning experience depending on whether participation is face to face, synchronous online or asynchronous via a recording of the lesson, as illustrated by the following comments:

It's not too different to being [there] ... you can still ask questions it's like being in the class really as long as [the lecturer] is watching the screen.

When it's a recording you sort of just go oh yeah I think that's this and then you don't think much of it but then when you actually have to make a decision and say A, B, C or D I find that sort of works a lot better.

And even watching those recordings afterwards where you've got time where everyone's thinking you think about it yourself and then you see the answer come up anyway so even the recordings of the tutes are good.

Finally, the following comment illustrates the benefits for learner-learner interaction of the text chat stream, as well as the way in which these kinds of tools and techniques are consistent with the way students use social media on a day to day basis.

We all communicate using the chat room and we are able to have a conversation with each other. It's not a difficult task to comprehend because we do this everyday over social media. Everyone feels comfortable in the chat room and it feels like they are in the room with us.

Discussion

This case study illustrates some key elements that emerged during a number of different case studies within the wider Blended Synchronous Learning project, including the following:

- Simultaneous remote and face to face participation;
- Multiple channels of communication between peers, small groups or the whole class (allowing students to ask questions without interrupting, undertake a stream of dialog between each other, and explore and share content) leading to a much more active learning experience where students are constantly constructing, articulating and querying their own knowledge representation;
- Interaction with peers and teachers in the context of problem-focused engagement with content (through whole class activities such as quizzes using the polling tool, or paired or small group activities such as the microscopic slide analysis and annotation activity in this case study) allowing the well-established benefits of cooperative learning to be harnessed both in class and in their private study (see, for example, Johnson, Johnson & Smith, 1998; Slavin, 1996); and
- Recording of sessions (allowing recorded sessions to be viewed/listened to later and an asynchronous discussion to emerge building on the discussion during the synchronous session).

Conclusions

The case study described in this paper has illustrated the way in which synchronous learning experiences can be transformed through the use of technologies and pedagogical strategies which allow for simultaneous remote and face to face participation, multiple channels of synchronous and asynchronous communication, problem focused collaborative engagement with content and the creation of digital artefacts through the recording of sessions. Additionally (although not evident within this case study) the ubiquitous availability of mobile devices, can turn the normally asynchronous private activity of viewing content, engaging in problem solving or exploring learning resources, into a synchronous or quasi-synchronous social activity.

We have argued in this paper that the integration of synchronous and asynchronous activities, including activities involving learner-learner, learner-teacher and learner-content interaction, which we term polysynchronous learning, can result in a learning experience that is qualitatively different than the sum of the component parts. Such activities can potentially have a major positive impact on learner engagement and consequently learning outcomes.

However, there are challenges for course and subject designers and for teachers in providing a focussed and well organised learning experience for students in polysynchronous environments. Poorly designed polysynchronous learning environments can potentially have a detrimental effect on learning, with learners becoming distracted by irrelevant dialogue within multiple communication streams, struggle to maintain concentration due to the high cognitive load in attending to multiple sources of content and discussion simultaneously, or engage only at a shallow level due to the rapid and abbreviated responses which are the convention in mobile communication channels. More research is needed which derives learning design principles and guidelines for teachers applicable to polysynchronous environments. Earlier research has demonstrated the value of interaction through designed rather than incidental learning activities (e.g. Borokhovski et al., 2012), especially when designed activities are informed by well accepted principles such as constructive alignment (see Biggs & Tang, 2011), and cooperative learning (Johnson, Johnson & Smith, 1998; Slavin, 1996). The challenge is to identify how best to apply what is known about learning design and about teaching to polysynchronous contexts.

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DEFINING A PEDAGOGICAL MODEL: THE TU DELFT ONLINE LEARNING EXPERIENCE

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Introduction

The Delft University of Technology (TU Delft) is a traditional brick-and-mortar research university, which specialises in Science, Design and Engineering. The university has one campus with 20,000 Bachelor and Master students and, after building years of experience in open education, has recently started offering accredited online education.

In 2007, TU Delft started a university-wide programme for OpenCourseWare (<http://ocw.tudelft.nl>), and during the past seven years has developed more than 150 courses, covering a wide range of content from 15 Bachelor and 35 Master programmes. From the start, it resulted in more attention for education. Externally, the programme gave other educators the opportunity to use and enhance our content, while internally, it improved the course quality for our students. This led the university to develop an open strategy, not only for education, but also for research. The university leadership strongly believes that 'open' is an obligation for a public university.

When in 2012 the Massive Open Online Course (MOOC) movement started, the university board decided to join edX (<https://www.edx.org/school/delftx>), a consortium of top universities founded by MIT and Harvard, with a strong focus on open education. TU Delft was the first European partner to join the consortium. In September 2013, the first two TU Delft MOOCs started with in total more than 80,000 students. Currently we have 17 MOOCs open for registration, which have welcomed approximately 365,000 students from all over the world.

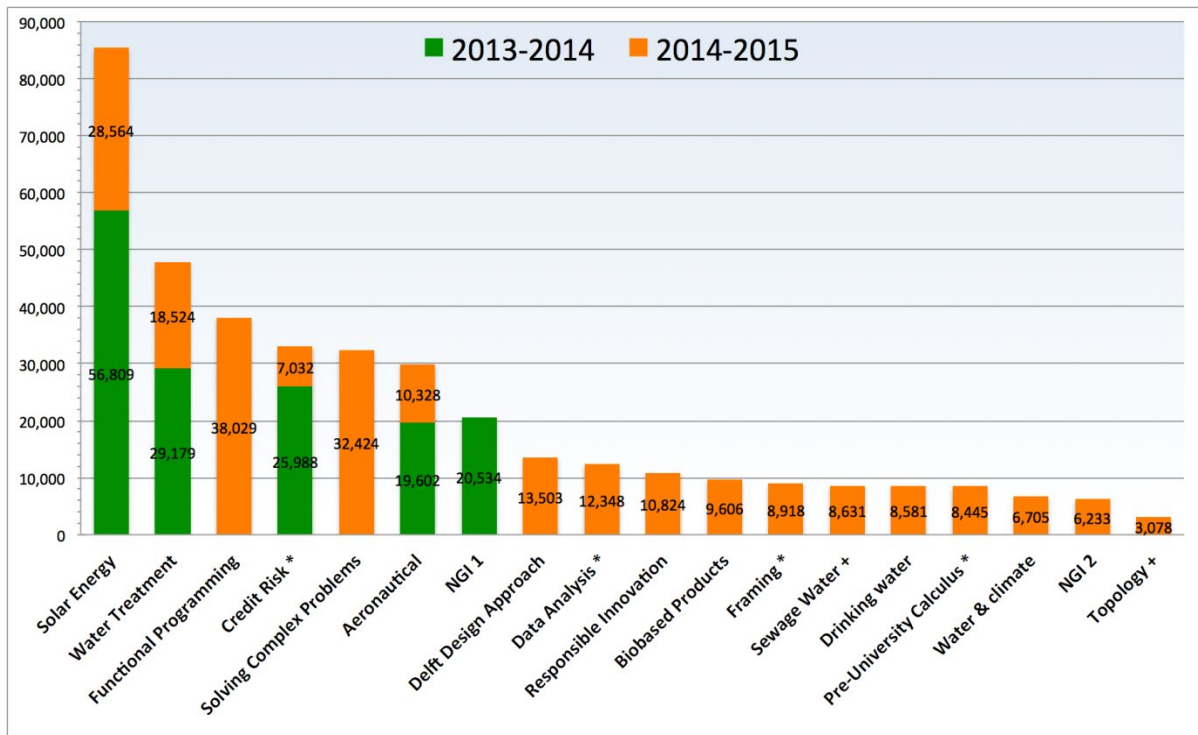


Figure 10. Number of enrolments per MOOC (+ course is running, * course has not started yet)

Together with the MOOCs, we started 3 pilot projects offering online courses. These included a full online MSc programme in Water Management, 6 courses of MSc Aerospace Engineering, and 5 courses of the MSc Engineering & Policy Analysis. This was also the start of the fully online accredited courses offered by TU Delft. The pilot showed that there was a great potential for online courses, but that we could not achieve this potential by operating on the traditional way education alone was organised.

In early 2014, the Delft University of Technology (TU Delft, 2014) started an innovative program with the aim to respond even more effectively to recent developments in open and online education, in order to meet the massive growth in demand for this type of education. The development of the Extension School, with a multidisciplinary team of experts in education, technology, business and management, is an important step towards a holistic approach that combines the entire open and online education portfolio at the TU Delft.

Drawing on the fields of Distance Education research and the university's vision of the "engineer of the future", Delft University of Technology's Extension School have created a unified pedagogical model and several instruments to support its implementation. This paper will describe the 8 principles that hold the Online Learning Experience (OLE) model, the stages in the course development process and an overview of how they are related to the OLE, its challenges and further developments.

Developing a pedagogical model

The creation of a pedagogical model is an important step for TU Delft, and contributes to greater consistency in the development of online courses. One of the model's strengths is to guide all course development teams through the realisation of several shared principles, which are supported by a common model that combines science, design and engineering education with online learning concepts. In addition, sharing our model worldwide is important as a means to engage future learners, who are interested in our online education. The model explains how online education at TU Delft has been set-up and what kind of an online learning experience it aims at.

In order to create a structured model, several steps have been implemented. These include the development of an online course proposal, teachers' training workshops, and regular meetings to give pedagogical and technical support. As Salomon (1992) argues:

... what matters is not just the design of a computer tool or program, not even the design of a single task or curricular unit. Rather, the cultivation of minds, which itself requires mindful engagement in a social process of meaning appropriation, requires that the whole learning environment, not just the computer program or tool, be designed as a well-orchestrated whole. This includes curriculum, teachers' behaviour's, collaborative tasks, mode of peer collaboration and interaction, tasks, learning goals, and the like (p.64).

In this sense, developing a pedagogical model for the TU Delft Open & Online Learning relates to more than merely adding distance learning principles and methodologies to a campus based environment. It involves preparation, planning, training and support, in order to successfully meet all different parts of the course development process.

TU Delft's Online Learning Experience

The Online Learning Experience (OLE) is a student-centred, online learning model that holds eight interrelated principles, which define TU Delft's online courses.



Figure 11. The eight principles that define TU Delft's Online Learning Experience

Flexible

The concept of flexible pedagogy can be perceived in a broader sense, meaning more than simply being able to study independent of time restraints or location. As Kirkpatrick (2011) argues, “students expect and need greater convenience and flexibility – in their choice of materials, their pace and timing, and their ways of learning” (p.19). In this way, flexibility is also about offering students the possibility to choose the educational resource format that will help them learn in a more effective way. In some courses, it may also be possible to select between different learning activities and topics to study, depending on the learning goals.

Diverse

Diverse learning and cognitive styles are more adequately supported when learners can choose between different content formats (Oz & White, 1993; Crosby & Stelovsky, 1995; Yaverbaum et al., 1997; Daugherty & Funke, 1998). Students will be challenged with different types of learning activities, which can be collaborative or individual, depending on their learning goals, in order to improve retention and performance, while motivating to learn (Kolb, 1984; Cassidy, 2004).

At another level, diverse groups of learners enrolled in our courses are enriched with different perspectives and ideas, contributing to a culturally-rich learning experience where integrity, respect and inclusion are fostered.

Inclusive

TU Delft’s contribution to open education creates, at a simple level, “a positive impact on society by providing access to education for those who could not previously access it” (Moore, 2014, p.200). But inclusion goes beyond simply giving access. Related with the *Flexible* and *Diverse* principles, inclusion requires preparing learning technologies, offering different types of learning activities, content in multiple formats and flexible choices to maximize student participation throughout the courses.

The learning technologies used and the way they are presented to students needs to be taken into account in order to promote an inclusive teaching and learning environment. As Moore (2014) describes:

... accessibility and flexibility of learning technologies cannot be assumed; rather, they result from intentional design considerations and features that seek to understand multiple users, operates from a pluralistic definition of learners, and seeks out solutions to make a design functional for as many users as possible (p.199).

During the course development process, several templates are used for the learning activities, content and course structure, in order to ensure a more accessible and user-friendly course to the widest possible audience, regardless of technology, device or ability.

Supportive

The importance of developing a learning community is stressed by several authors (Lipman, 1991; Pallof & Pratt, 1999; Garrison, Anderson & Archer, 2000; Wenger, McDermott & Snyder, 2002), where members both support and challenge each other, leading to effective and relevant knowledge construction (Anderson, 2008). Our courses are designed to promote the development of a learning community where students can share experiences and learn from others, supported by an e-teacher with expertise in the field that gives direct instruction and guidance, promotes peer interaction, answers questions and gives feedback throughout the course to facilitate learning. The 5-stage model provided by Salmon (2000) is an effective way to support and build the learning community that should be customized to the unique needs of each online learning community.

Interactive

In an online course, interaction can be seen as a continuum that grows from the simplest learner-interface interaction (accessing information) to higher-levels of learning, when learners can apply what they learn in real life and develop meaningful knowledge from information – learner-context interaction. In order to reach these high-levels of learning, other types of interaction are also required: learner-content and learner-support (interaction with other learners and the e-teacher). In fact, learner-support interaction is critical to the development of communities of learning (Rumble, 1999; Murphy & Cifuentes, 2001; Wenger, McDermott & Snyder, 2002). Our courses are designed to provide different forms of interaction, using interactive strategies that promote learning at different levels (Schwier & Misanchuk, 1993; Gilbert & Moore, 1998; Berge, 1999), with a focus on high-levels of learning.

Active

An important method that is promoted at TU Delft is that of active learning: a learner learns most effectively when actively engaging with the content and actively create knowledge. With active learning, the focus lies on learning instead of instruction. Students are required to read, write, discuss, or be engaged in solving problems. Active learning engages students in two aspects – doing things and thinking about the things they are doing.

A second aspect that is considered important is that active learning is not only an individual activity, but should also be done in interaction with others, because “knowledge is socially constructed and learning develops as a result of dialogical and dialectical interactions between teachers and learners and between two or more learners” (Vygotsky, 1978). Learning is seen as a social process where interaction between students, but also between students and teacher, is important for the learning process (social constructivism). In our online courses, students will be able to actively engage with the learning community and course content, embedded in the TU Delft’s spirit to think critically, to take the initiative, to operate independently and to work in teams.

Authentic

According to Ring and Mathieux (2002), online learning should have high authenticity, high interactivity and high collaboration. As mentioned in the *Interactive* principle, our courses are designed to promote learner-context interactions to reach high-level learning, enabling students to apply technical and scientific know-how into their own context. Some courses give students the opportunity to participate in discussions about important issues in society. In other learning activities, collaboration is needed to come up with solutions to solve real-world problems.

Innovative

TU Delft's research approach of open and online education is principally engineering-based, inter-disciplinary, and strongly data-driven. Increases in the available amount of quantitative and qualitative educational data offer researchers new opportunities to observe, analyse, and ultimately improve learning processes. The *Innovative* principle relates directly to a number of emerging developments in education, inspired by reports, such as the NMC Horizon Report for Higher Education (<http://www.nmc.org/nmc-horizon>). This kind of innovation requires close cooperation with teachers and course developers as well as direct evaluation and analysis. The results and conclusions will feed back to the course development process and teacher training, aiming to optimize the online learning experience.

Implementing and evaluating the model

In order to support course teams well, a number of stages in the course development process have been defined. First, the orientation stage, in which a project proposal is written by the teacher to get funding and support for developing an online course.

Then the preparation stage, in which a course team is formed, teachers are trained during a kick-off meeting and via the training opportunities the Extension School has to offer. In this stage courses are designed with the support of the e-learning developers and the production is planned. Course teams have to search and select what open learning materials are available that they can use or adapt and what has to be developed by themselves.

In the production stage, course content is produced, like assignments, tests and videos and the course design is implemented in the digital learning environment. After that, the course is tested by beta testers to see if everything is working as intended.

In the delivery stage, the course will run and possible improvements will be identified. After course delivery, the follow-up stage is meant to evaluate the whole process with the course teams and prepare for the next run.

Table 1 shows an overview of the stages in the course development process and how they are related to the Online Learning Experience and support staff.

Table 14: Applying the OLE model throughout the course development process

Course development process stage	What has to be done	Activity to implement OLE and instruments	Who (Support staff)
1. Orientation	Write proposal	Introduce OLE model to teacher	Account manager and product manager
2. Preparation	Create course team Kick off meeting Training Course design and planning	Train course teams according to the OLE Help course teams apply the OLE in course design, using guidelines	E-learning developer and product manager
3. Production	Produce course content and implement it according to the course design	Guide in developing content that meets OLE using templates	Instructional designer, teaching assistants and e-learning developer
4. Test	Test course	Checklist to ensure course is according to OLE principles	Beta testers
5. Delivery	Run course and identify improvements	Pedagogical and technical support to run the course according to the OLE	E-learning developer, instructional designer and technical support
6. Follow-up	Evaluate and prepare for next run	Questionnaires Report that identifies points to address in re-run	E-learning developer and policy officer for quality assurance

Evaluating the OLE requires an evaluation of the process by its actors: students, teachers and staff. Quality assessment is based on guidelines and indicators from the European Foundation for Quality in e-Learning (EFQUEL) and the European Association of Distance Teaching Universities (EADTU), allowing TU Delft to evaluate its online learning courses and programmes using internationally agreed quality standards.

The evaluation process of the learning experience includes the collection of learners' feedback through questionnaires and preparing a report, where the gathered data is analysed and converted into clear recommendations for improvements. The final step is to improve the next course re-run, incorporating recommendations previously identified, which therefore contribute to continuous course improvement.

The overall evaluation practice includes, not only the online learning experience itself as experienced by students, but also the support given by staff during the course development process. At another level, all evaluation procedures regarding engineering education will be included.

Challenges and further developments

Naturally, the many challenges that need to be resolved will help us refine the development of this model. Many educational scenarios coexist among TU Delft's eight Faculties, from courses with traditional lectures to a strong focus on constructivist pedagogies like active learning, project-based learning and design-based learning. Wrapping up different learning strategies in a single model can be seen as challenging, since it needs to take into account different didactical approaches. In this sense, the OLE can also be an opportunity to think

about the changing need in educating engineers (Kamp, 2014), leading to positive changes in pedagogical practices and learner experiences.

Creating and implementing the OLE is an important step to ensure high quality online courses. The aim of the Extension School is to be innovative, which means that the model will continue to develop based on new research, evaluation and experience that we gather at TU Delft. Although still under development, the model is already being gradually implemented in TU Delft's online course creation process. After further developments of the OLE, we will start implementing it more broadly.

Having the vision to "Educate the world & enhance quality of online & campus education", the Extension School is developing TU Delft's strategy for the next phase of open and online education, extending its offering and reaching more students across the world. We believe that the OLE will help us achieve this in a more consistent and sustainable way.

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AUGMENTED REALITY IN ONLINE EDUCATIONAL CONTEXTS: THE UOC CASE STUDY

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Introduction

The rapid growth of Information and Communication Technologies (ICTs) over the past decade has dramatically changed the ways in which people relate, communicate, and live. Technologies and applications that were hardly used some years ago (social networks, *smartphones* or tablets could be good examples) are already part of our daily lives. The educational field is not an exception in the 21st century trends, and ICTs have started to become common tools to support and guide the whole process of learning (Daly, Pachler, Mor & Mellar, 2010). Nowadays, learning environments are starting to integrate the use of computers, internet devices, multimedia materials, Web 2.0 authoring tools, simulations, games or, more recently, mobile phones and immersive technologies (Dror, 2008).

The application of ICTs in educational settings is particularly relevant for the European Higher Education Area (EHEA), an initiative of the Bologna process designed to create more comparable, compatible, and coherent higher education systems in Europe. The Bologna Declaration (Bologna Declaration, 1999) brought substantial reforms into High Education (HE) that implies changes in traditional teaching and learning strategies. Within this framework, there is a claim for adopting constructivist methodological approaches to learning. These approaches should be learner-centred and provide conditions to promote authentic learning activities. Precisely, Augmented Reality (AR) technology is increasingly being recognized as a new medium that could help HE institutions to meet some of the requirements of the EHEA (Fonseca, Martí, Redondo, Navarro & Sánchez, 2014; Mejías-Borrero & Andújar-Márquez, 2012). AR provides unique features which enable the development of situated, experiential, contextualized and authentic teaching/learning activities (Santos, Chen, Taketomi, Yamamoto, Miyazaki & Kato, 2014).

In a broad sense, AR can be defined as an emerging technology that allows the introduction of digital elements into the real world. That is, the user could see an image composed of the visualization of a real environment and virtual elements (such as videos, pictures, sounds, texts or 3d models) that are overlapped to it. One of the main aspects of AR is that virtual elements provide to the user relevant and useful data that is not available in the real world (Botella, Juan, Baños, Alcañiz, Guillém & Rey, 2005). Thereby, in educational settings AR has

a great potential to exploit the affordances of the real world by providing additional and contextual information that augments learners' experience of reality (Squire & Klopfer, 2007). AR allows for new ways to access information and to interact with the environments that can be used to design better learning experiences.

Is important to note that the term AR is closely related to Virtual Reality (VR), both are contained within the Milgram Reality-Virtuality Continuum (Milgram & Kishino 1994) (Figure 1) and reflect different levels of user's immersion in environments where physical and digital objects can co-exist. However, the main difference between them is that VR technology completely replaces the real environment with digital information, whereas AR complements the real world with virtual data (Azuma, 1997).

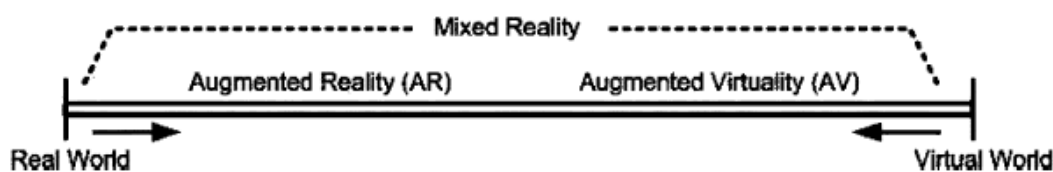


Figure 12. Reality-Virtuality Continuum proposed by Milgram & Kishino (1994)

Today, AR is enough mature and accessible for designing successful learning experiences. These experiences can be created and displayed by a wide range of technologies, including Head-Mounted Displays (HMD), desktop computers, laptops or handheld devices (such as *smartphones* or tablets). Generally, AR systems can be classified into four main categories (based on Johnson, Levine, Smith & Stone, 2010 and Lens-Fitzgerald, 2009):

- Physical World Hyper Linking: This is the oldest form of AR and includes the use of 1D codes (barcodes) and 2D codes (QR Codes). Some authors don't consider it a real form of AR.
- Marker type: The markers (black and white square images) are placed in front of a camera connected to a device. Once the marker comes into the view, digital elements are superimposed to it.
- Marker-less type: This is the most heterogeneous and emergent AR category. Markerless-based applications need a tracking system that involves a GPS, a compass, and an image recognition device instead of using a marker.
- Augmented Vision (AV). This category is still under development and includes unobtrusive devices such as smart glasses or contact lenses. AV allows for natural free-hands interaction with any object in the real world.

For the last ten years, educational institutions managed to adopt modern devices and new possibilities for teaching and learning provided by AR have been increasingly recognized. Consequently, several AR systems have been developed for enhancing traditional learning and training practices. Note, for example, that it has been used to develop simulation games performed in the real world, illustrate complex spatial or temporal relationships, visualize abstract concepts, experience phenomena that is not accessible in the real world, interact with 2D or 3D learning objects, develop narratives that cannot be developed in other

technological environments, enhance paper-and-pencil educational formats, deal with the information and interact with theories in an innovative way or to learn foreign languages, among others (Billinghurst & Duenser, 2012; Chang, Morreale & Medicherla, 2010; Santos et al., 2014; Wu, Lee, Chang & Liang, 2013). As pointed by Johnston et al. (2010):

“AR has a strong potential to provide both powerful contextual, on-site learning experiences and serendipitous exploration and discovery of the connected nature of information in the real world” (p.21).

These educational benefits have made AR one of the key emerging technologies for education over the next years. However, beyond the proliferation of AR applications in education, the use of this technology in eLearning contexts is still in a very immature stage. AR provides huge opportunities for eLearning, especially in disciplines that are unsuited to completely non-classroom training and that requires practical training (Mejías-Borreo & Andújar-Márquez, 2012), but its potential is just now being explored (Tsai, Shen & Fan, 2014). In addition, studies that investigate instructional strategies for applying AR are still lacking (Santos et al., 2014). As pointed by Fabregat (2012), there is no information available about the criteria to consider when using AR in eLearning. Nowadays, more research is needed to better understand when and under what circumstances could be useful integrate AR technologies in eLearning contexts.

Research objectives

The specialized literature reveals a relatively large volume of published studies that report advantages, limitations, effectiveness or challenges of using AR in education (Bacca, Baldiris, Fabregat, Graf & Kinshuk, 2014; Tsai, Shen & Fa, 2014). However, almost all these studies focused on the role of AR in face-to-face learning environments (Wu, Lee, Chang & Liang, 2013). In addition, the few experiences on AR and online education have been conducted as isolated practices in traditional face-to-face universities.

Today, there are no precedents in using AR as a transversal strategy in a fully online university. It is important to start to understand the possible impact of its use in online educational settings, describing how can be used it to generate authentic learning activities. More research is also needed to understand which are the most appropriate instructional designs for implementing AR in online education environments. Precisely, the present study is aimed to explore UOC's faculty opinions and recommendations regarding the introduction of AR technology within the UOC's virtual classrooms.

This research is part of a broader project in which AR technologies will be implemented within the UOC educational model. The UOC eLearning educational model gives the central focus on the students learning activity and includes three essential elements: the learning resources (referred to the items needed to perform a learning activity), the collaboration (includes a set of tools that encourages communication and teamwork among students) and the accompaniment (group of actions performed by the teaching collaborators) (García, 2013). The educational model of the UOC is outlined at Figure 2.

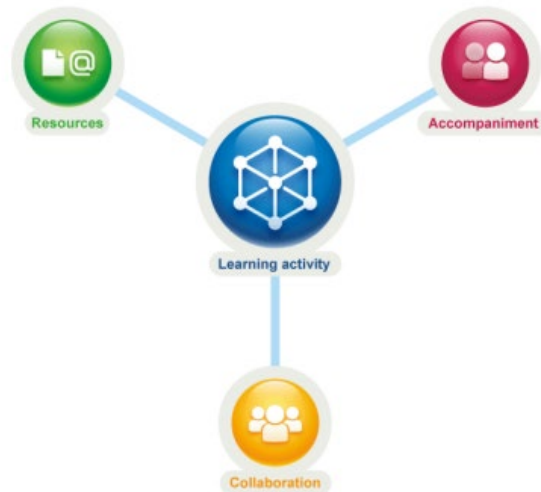


Figure 2. The UOC educative model

In particular, this study corresponds to an early stage aimed to explore the feasibility of implementing AR technologies within the UOC educational model. The specific objectives of the study were the following:

- Determine if AR can bring benefits to the students' learning.
- Identify what are the most appropriate AR tools and technologies for the UOC educational model.
- Identify what types of AR learning experiences can be designed to foster meaningful learning.
- Identify what types of instructional design are recommended when introducing AR in online education.

Methodology

Instruments

A mixed methods approach was used to collect data from fixed-choice and open-ended questions utilizing an on-line survey. The survey was primarily adapted from the Virtual Worlds Faculty Survey (Wood, 2010). In addition, new liker -scaled items and open-ended questions were included based on the objectives posed for the study and the review of the relevant literature. Finally, the survey was composed by four main blocks:

- Demographic questions. 8 questions
- Familiarization with AR and previous experience. 7 fixed-choice and 6 open-ended questions.
- **Faculty perceptions about AR technology.** 41 likert-scaled statements adapted from the Virtual Worlds Faculty Survey (Wood, 2010).
- **Faculty perceptions about the use of AR within the UOC educational model.** A set of 13 items in which likert-scaled statements and open-ended questions were combined.

At the present work, only the most relevant data and findings will be presented.

Participants profile

Fifteen teachers from the UOC's Master in Education and ICT (eLearning) participated in the study. Nine were men (60%) and six were women (40%), with a mean age of 40.54 years (SD 7.70, range 31-55). Regarding the years of academic experience the mean was 16.80 years (SD 8.64, range 4-31). Sample demographics also identified 12 teachers (80%) and 3 course coordinators (20%).

It is important to note that the teachers of the Master in Education and ICT are highly familiarized with the instructional design, use and promotion of ICTs in eLearning. Therefore, they are well situated to reflect and judge about the possible integration of AR into the UOC educational model.

Discussion and conclusions

This study was designed to gain insights into UOC's faculty perception on using AR technology within online educational contexts. As far as we know, we would like to highlight that this is the first study addressed to the faculty members with the aim of asking them about the use and implementation of AR as a teaching and learning strategy in online learning environments. In this sense, the results obtained aim to provide some light for those interested in starting to use AR in an eLearning context or to those who are already using it, but would like to improve their current practices.

This study found that most of the faculty already knew what AR is and additionally knew that it could be used for educational purposes (93.3%). In addition, 53.3% of them had used it in his/her educational practices (the uses were mainly focused in using QR Codes to augment some elements of traditional textbooks) (Table 1). However, it is important to remember that the surveyed teachers are highly familiarized with the use of ICTs in education. This could have a positive effect on these findings.

Table 15: Types of AR used by UOC's faculty members in educational contexts

AR type	Frequency	Percentage
QR Codes	8	53.3%
Marker-based	5	33.3%
Geolocation	1	6.7%
Other forms	0	0%

Besides that, the number of teachers considering that they have good knowledge about the benefits, costs and AR educative applications was very low (Table 2). They perceived that do not possess the necessary skills and knowledge to learn how to use AR in an online classroom. It is important to note that these results were confirmed by the qualitative findings of the open-ended questions.

Table 2: Degree of knowledge of the UOC's faculty about the benefits, costs and educational applications of AR

Questions	Not at all %(n)	Slightly %(n)	Somewhat %(n)	Enough %(n)	Quite %(n)	Extremely %(n)
AR benefits	13.3 (2)	6.7 (1)	53.3 (8)	13.3 (2)	13.3 (2)	0 (0)
AR costs	13.3 (2)	20 (3)	40 (6)	26.7 (4)	0 (0)	0 (0)
Applications	13.3 (2)	66.7 (10)	0 (0)	20 (3)	0 (0)	0 (0)

A concern over the need for faculty development in learning how to use AR technology in online education emerged in this study. The majority of the participants exposed that they needed training in AR technologies to know how to incorporate it into the UOC's educational model. They also expressed interest in implementing AR technologies in their courses and indicated good availability in get involved in future training activities. To address these perceived challenges, we plan to offer training opportunities and Open Educational Resources (OER) about the topic for the UOC faculty.

Results point towards that the implementation of AR into the UOC educational model would be beneficial for the institution and would have a positive impact on student's motivation. This suggests that the adoption of AR learning and teaching strategies could be attractive for online students and, by extension, can provide some help in reducing the elevated number of dropout rates in online educational programs. In future, we will conduct new research studies to evaluate the impact of AR on the number of dropouts at the UOC.

In general, the faculty considered that the implementation of AR within the UOC's educational model is feasible and appropriate. Specifically, their responses showed that the most appropriate AR-technology for our eLearning environment is geolocation-based AR and, in a lesser extent, AR marker-type. Faculty highlighted the potential of geolocation to enhance contextual information, foster everywhere, everytime learning, conduct role playing activities and promote be active and explore the real world. Regarding the use of markers, faculty stressed its potential to facilitate the understanding of complex and abstract phenomena.

Finally, regarding the recommended instructional and learning approaches, there was consensus in consider that AR has a great potential to engage UOC students in more authentic activities by promoting game-based learning and discovery-based learning. Participants also perceived that the implementation of AR can increase collaborative learning and student-centred learning. Table 3 highlights the answers to close questions. The results were confirmed with qualitative analysis from the open-ended questions, which stressed the relevance of collaboration, game-based learning and discovery-based learning. In a wider sense, this approach is similar to those used by Squire and Klopfer (2007), who developed a variety of mobile AR-educational games for face-to-face K-12 education. Now, the challenge (and the main innovation) is to adapt these educational strategies and implement it within an online higher education environment.

Table 3: Recommended instructional and learning designs for implementing AR within the UOC

Questions	Not at all %(n)	Slightly %(n)	Somewhat %(n)	Enough %(n)	Quite %(n)	Extremely %(n)
Authentic Learning	0 (0)	6.7 (1)	26.7 (4)	33.3 (5)	33.3 (5)	0 (0)
Learning complex concepts	0 (0)	13.3 (2)	26.7 (4)	20 (3)	26.7 (4)	13.3 (2)
Collaborative Learning	0 (0)	13.3 (2)	26.7 (4)	26.7 (4)	33.3 (5)	0 (0)
Game-based learning	0 (0)	0 (0)	6.7 (1)	20 (3)	53.3 (8)	20 (3)
Discovery-based learning	0 (0)	0 (0)	13.3 (2)	20 (3)	33.3 (5)	33.3 (5)
Sense of belonging	0 (0)	13.3 (2)	33.3 (5)	40 (6)	13.3 (2)	0 (0)

The results obtained in the present study will guide the development of the next phases of the project, in which we will design, develop, implement and evaluate AR learning and teaching strategies within the UOC's educational context. In particular, we plan to use geolocation-based AR though the use of wearable technologies to promote discover-based learning, enhance collaboration processes and engage students in authentic learning activities.

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BAZAAR: INFORMAL LANGUAGE LEARNING AND EXCHANGE AT MARKET PLACES

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Introduction

The main aim of the European Research & Development project ‘Bazaar: Learning and Exchange at the Market Place’ (<http://www.bazaarproject.eu>¹) is to promote language learning and at the same time the exchange experiences, knowledge and ideas amongst adult learners with a migrant background in daily settings. The educational approach is based on the key concepts of learner centricity; informal learning; learning embedded in everyday contexts; social inclusion, community and citizenship. By these means Bazaar tries:

- To empower individuals, to promote social interaction and enhance intercultural dialogue at community level;
- To relate to societal needs, to promote social dialogue and social inclusion of migrants and to encourage their civic engagement;
- To trigger the motivation to learn amongst the migrant population in the partner countries, especially those often excluded from education e.g. older men and women;
- To design and to test learning activities, methods and materials that are sustainable and replicable.

Bazaar uses the term ‘Market Place’ in both ways, literally and metaphorically:

- As a concrete space where people naturally meet and interact;
- As a place used to facilitate communication, cooperation, intercultural awareness and a ground of mediation to resolve possible resolve conflicts;
- As a concrete learning environment that sustains the integrity of all learners as they attain relevant educational success;
- As a place of ideas and as a place to apply creative thinking;
- As a learning facilitator.

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The concepts of Bazaar have been tested in diverse learning environments in Bulgaria, Germany, Italy, Portugal and the United Kingdom.

Bazaar within the Changing Dynamics of Learning

Formal, Non-formal & Informal Learning

In the field of developing language competences for migrants, formal learning plays a role, if proof of minimal language competences is a legal condition e.g. for the permission to stay, to work, to have a right for social support, to be allowed to claim for citizenship. Those legal regulations traditionally need formal accredited institutions to deliver the compulsory language competences in a sufficiently standardized way.

Non-formal learning can be found, for example, in voluntarily taken language courses, based on codified curricula and learning methods, materials and related certification schemes. They seem to be offered mostly in the countries of origin, under rules set by the big national institutions which have a legal responsibility for the respective language as a 'foreign language'.

Informal learning occurs most frequently when migrants experience or suffer from serious limitations in their basic needs (ranging from hunger to social contacts and life perspectives). Motivated by physical and social survival, they search for and identify every means to improve their communication competences. In many cases these are completely unconscious: from nonverbal signal systems, body language expressions and using words without any grammar or with the most rudimentary construction. This behaviour is consistently observed in migrants starting to survive in a foreign language environment without any local language competences acquired in formal or non-formal learning.

As a consequence Bazaar needs wide ranging definitions of learning and learning materials. This means employing learning resources of whatever origin as they are used in informal processes by supportive persons such as parents, sisters and brothers, other relatives, neighbours, peers of all types, volunteers etc. They are also used when supporting any type of bridging between formal and informal learning. In Bazaar these resources and tools of informal language learning are extended to everyone involved in the process i.e. the Bazaar marketplace. Contextualized classical media is used as a language learning resource.

Lifelong Learning

Language learning in the compulsory schooling is not sufficient for the needs of 21st century globalised societies. This is of particular true for migrants: language competences and support for social inclusion needs learning 'from cradle to grave' in order to provide equal opportunities for all EU citizens irrespective of age, gender, place of living, socio-economic and educational status and cultural background. As a consequence this needs measures to increase substantially the national language competences of subgroups like elderly migrants under intensive care or living in sheltered homes, mostly with special needs and mental

disorders. Bazaar needs to pay also some attention to language competence challenges caused by the processes of demographic change.

Life-Wide Learning

Life-wide learning implies that learning processes are no longer regarded as restricted to one role in the life of citizens (e.g. as a professional; as a parent) or related to citizenship, values or beliefs, but relevant for all roles, including transfer between and synergies amongst those roles as well as increased coherence between them.

The metaphor of markets highlighted in Bazaar almost automatically includes such a life-wide learning perspective encompassing basic needs, social contacts, leisure and entertaining elements, professional development, volunteer commitment and so on. In the past learning resources were scarce and costly. Language learning needed to be organized in activities, predominantly or even completely for learning outcomes to be 'stocked' for future use: they were not structured for immediate use in everyday life.

With accessibility to 'all knowledge of the world' for anybody anytime anywhere, learning resources and learning opportunities became and will continue to become an integral part of all human activities. As all activities in the 21st century are in permanent flux (i.e. economic, technological, demographical, cultural, conditions for life, housing, mobility etc), human activities not only allow learning integrated into, but demand permanent and immanent learning processes.

Life-Embedded Learning

Paraphrasing a term from technology (i.e. 'embedding' ICT functionalities into almost all technical devices in the nearby future), the term Life-Embedded Learning (LEL) is increasingly used. LEL means learning processes that are functionally integrated into all our activities. They are informal and sometimes intended, but also frequently not intended. However, they always produce learning outcomes that can be assessed. For example, more and more people learn a lot preparing for, during and after a consultation with a doctor on their health problems. By undertaking this procedure they are becoming 'competent patients' in a cooperative process maintaining and improving their health in a mutually beneficial partnership.

Life-Relevant Learning

By merging the strands of lifelong, life-wide and life-embedded learning into Life-Relevant Learning (LRL), the implicit processes and outcomes will become more relevant for an individual. The empirical evidence of the last decades demonstrates that the relevance of learning and its outcomes is by far the most important factor for learning success. When expected learning outcomes are sufficiently relevant for an individual, she or he will find adequate and accessible ways to achieve these outcomes. The contributions of didactic concepts, preparation of learning material and learning pathways seem to have marginal impact on learning outcomes. The almost ubiquitous availability of learning resources 'at your

fingertips' puts the focus on the motivation of the individual. We have to select only a few priorities, even though we are confronted with an almost infinite choice of learning opportunities. It may not be not always fully recognised today, but personal priority decisions become more and more central.

Lifelong, life-wide, life-embedded equals life-relevant learning or $LL + LW + LE = LRL$ as a 'formula'. Life-relevant learning has the societal potential to convert learning as a privilege for some into learning as a human right for mankind. This human right has to and will include the Bazaar target group of disadvantaged migrants. Bazaar will paradigmatically refer to learning resources, learning practices, learning environments and the underlying learning cultures as an interpretation of the richness of our learning marketplace metaphor.

The Bazaar Language Learning Programme

Framework

Proposed and launched in 2001 by Council of Europe "to achieve greater unity among its members by the adaptation of common action in the cultural field", Common European Framework of Reference (CEFR) aims at improving language learning in accordance with certain general measures. Namely these measures have been set out to include the following:

- To deal with the business of everyday life in another country;
- To exchange information and ideas with young people and adults speaking a different language and to communicate their thoughts and feelings;
- To attain a wider and a deeper understanding of the way of life and forms of thought of other people's and of their cultural heritage;
- To promote, encourage and support the efforts of teachers and learners at all levels to apply to their own situation by basing language teaching and learning on the needs, motivations, characteristics and resources of the learners; by defining realistic objectives as clearly as possible; by developing appropriate methods and materials; by developing suitable forms and instruments for the evaluation of learning outcomes.

Bazaar has adopted the above aims and objectives and applied them to its everyday migrant cultures and communities. The project aimed to raise the awareness of our migrant learners' current knowledge of their target culture and language

Objectives

The language learning programme proposed by Bazaar therefore comprises four dimensions:

- Global – introducing the participants to all competence areas of the target language, namely, linguistic competence, socio-linguistic competence and pragmatic competence leading to general communicative competence;
- Modular – improving learners' language competences in a bazaar setting for particular purpose;
- Weighted – focusing on acquiring language skills in certain directions and proficiency levels;

- Partial – taking a teaching responsibility only for certain activities and skills in line with the particular bazaar settings existing in the project partner countries.

Methodology

In order to fulfil the project's ambitious objectives, the language learning programme of Bazaar has been designed to be realistic, comprehensive, authentic, transparent and coherent. In this context comprehensive means that specifying a pre-set range of language knowledge, skills and use as much as possible. By realistic, we mean a down-to-earth approach adapting the slice of real life situations in its teaching, activities and materials. By authentic, we mean utilizing real life materials that the learners might encounter in their daily life. By transparent, we mean that the information to be presented is clearly designed and explicit in order to achieve co-constructed and foreseeable outcomes. As for the coherence, we mean the programmes have orderly and contradiction-free internal structures. The design of the programme has been arranged in a manner that it is multi-purpose, flexible, open, dynamic, user-friendly and non-dogmatic:

- Its multi-purpose design provides an easily-applicable structure for the full variety of purposes involved in the planning and provision of facilities for language learning as far as communication skills and target culture literacy.
- Its flexibility provides an adaptable platform to use the programme in different circumstances.
- Its open nature serves us with its capability of further extensions and refinements.
- Its dynamic design enables a continuous evolution and modifications in response to experience in its use.
- As it is very user-friendly in its design, it is readily understandable and applicable by the trainers and the learners.

Being non-dogmatic, the programme adopts an eclectic mode and it is not restricted to any linguistic or educational theories of practices.

The Bazaar Learning programme offers 40 to 60 hours of training in an informal learning environment. Considering the social and psychological barriers of the prospective immigrant participants non-threatening learning and supportive environment have been created to facilitate the learning and to encourage a social ambience to embrace them. For this very reason, Bazaar involves peer trainers from the target immigrant groups to support the socialization process and to avoid communication break downs.

The language skills, specifically receptive, productive and interactive skills, to be attained in the programme have been specified as A1 and A2 according to CEF. The reason for this is that the participants are expected to be total or false beginners in the target foreign languages and, for the feasibility purposes, these levels are the outmost levels to be attained by basic users. The teaching materials and activities essentially reflect real life use and are communicative in nature to the extent that they require learners to comprehend, negotiate and express meaning in order to achieve a communicative goals such as ordering, bargaining, marketing, labelling, asking for appointment, obtaining health services etc.

By the same token, the tasks to be utilized involve creative, skill based, problem solving, routine transactions, performing a role in a communicative act, taking part in a discussion, planning a course of action, reading and replying to a message, carrying out banking transaction, functioning in government offices. In summary, the programme aims at equipping the participants with the skills required to function in personal, public and occupational domains in real life.

The project proposes a flexible series of piloting steps in which the content is arranged and compiled according to the needs of the practitioners and the learners. The piloting has been structured so that it is familiar to the various bazaar contexts in the partner countries and so would obtain relevant data for stakeholders who would benefit from the outcomes of the project. The piloting steps include the following:

- Step 1. Identifying the learning context;
- Step 2. Identifying the learners;
- Step 3. Conducting needs analyses;
- Step 4. Responding to the needs through the organisation of the learning objectives;
- Step 5. Involving peer leaders, trainers and coaches and having an exchanging workshop to prepare an action plan;
- Step 6. Development of learning materials;
- Step 7. Carrying out the activities with the target group;
- Step 8. Follow-up evaluation, reporting and documenting.

Learning Materials

In the material development, Bazaar followed a consistent and real life-based approach equipping the learners with the skills required to function in linguistic, social and cultural contexts. In this approach, the competencies related with receptive, productive and interactive skills at A1 and A2 levels have been considered in the development of materials. The topics referred to in these materials and the related learning activities cover the ones encountered frequently in their daily life such as: Personal details/experiences; Work; Education and training; Housing; Family and friends; Health, care and well being; Transport; Weather; Buying goods; Leisure; and the Host society.

The learning activities may include communicative tasks that learners are required to tackle in order to deal with the situations in real life context such as communicating with a landlord about a house repair to be done, or negotiating with a supplier for a purchase. In these activities, the learners are asked to engage with a wide range of text types such as the following: Advertisements; Public signs and notices; Lists; Timetables; Forms; Records; Diagrams; Letters, emails and other correspondence; Notes; Leaflets; Sets of instructions; Simple narratives; Simplified newspaper or magazine articles.

Language Learning Activities

Bazaar language activities are contextualized within particular situations in which social life is organized. Within this scope, the activities involve the performance of tasks which are not solely language activities. In realising these tasks, the learners' communicative competence is activated. The communicative competence has the following components:

- Linguistic competence;
- Sociolinguistic competence;
- Pragmatic competence.

The term 'communicative competence' refers to a language user's grammatical knowledge of rules, sounds and vocabulary, as well as his/her social knowledge about how and when to use this knowledge appropriately. In order to deal with the social dimension of language use, additional to the linguistic knowledge, one has to be competent in using communication strategies that vary from one culture to another. Linguistic markers of social relations such as use and choice of greetings, or politeness conventions are frequent sources of inter-cultural misunderstandings.

Similarly, competence in use of interaction strategies, such as the ability to use a suitable phrase to take turns during a conversation, is a requirement for the successful performance of communicative functions. Keeping these in mind, Bazaar learning activities are structured in a way that asks learners to carry out communicative tasks engaging learners in language activities and communication strategies at the same time. In the selection of such tasks, the context in which learners are being prepared to operate is considered. The following - 'Communication at Shops/Markets/Bazaars' illustrates language-using tasks learners may be required to tackle in order to deal with the situations which might arise in their daily life.

In addition to real life tasks as exemplified above, the Bazaar training programme also includes some other kinds of tasks that are pedagogic in nature. The aim of such tasks is language acquisition in particular. This type of language activity offers the de-contextualized practice of target language forms and orthographic knowledge for handling the writing system of the language in focus.

Results of the Bazaar Pilots

In the last year five hosting countries of Bazaar conducted their piloting, which represents the heart of the project, the concrete product of the "learner – centred" and "informal learning" innovative approach of Bazaar.

Bulgaria signed a cooperation agreement with the State Agency for Refugees and then worked in Sofia with a group of 19 refugees recently arrived in Bulgaria and with little or no Bulgarian. Since most of them wanted to stay in the country and to find a job, the activities' aim was to give a basic knowledge of Bulgarian. At the end of the piloting all learners were able to manage a basic conversation and they were ready to come in contact with the hosting society in a deeper way.

Germany is still running a piloting exercise in Erlangen with very particular features and aims, called “MediCourse for Refugees”. It is addressed to chronically ill refugees, pregnant women and parents of small children who have a pressing need to learn German so they can communicate with the physician and the medical staff and follow the rules of conduct in relation to their disease.

Italy held three pilots from October 2013 to October 2014 in Perugia, involving three different target groups: Moroccan women, Ukrainian caregivers and a group of migrants of mixed origins. All the participants had in common that they haven’t received was no previous formal education in Italian. The pilots generally started in a market square and then took place in indoor locations. The feedback from the participants was positive, inasmuch as some of them decided to keep on studying Italian in formal courses.

Portugal held its piloting in one of the most multicultural squares of Lisbon in the month of August 2014. Portuguese trainers were generally young students of language and came from foreign communities; they had very long sessions on Saturday afternoon and they worked especially with young Chinese women who wanted to start their own business or had it already and needed to improve their basic skills in Portuguese.

The *United Kingdom* experienced a really interesting piloting in Heckmondwike, West Yorkshire with a group of Pakistani immigrant women with little or no English. Helped by a peer mentor from the Pakistani community, these women were gradually taken from their ‘comfort zones’ into new informal situations of life and English use and they carried out the learning activities in such as the staffroom of their children’s school, a local supermarket, the library and a gymnasium.

Lessons Learnt & Recommendations

When designing the piloting activities of Bazaar the project partners asked themselves: “What factors could cause language training for our migrant communities to fail?”

Those organising the language learning need to appreciate that failure may result from:

- Focus on formal learning and teacher-centred training cultures;
- Not taking account of learners’ perspective/learners’ orientation;
- Inadequate methodologies / knowledge / intermediates;
- Deficiency of skills related to this kind of engagement (‘cultural arrogance’);
- Lack of resources for customizing learning materials and dealing with diversity (e.g. learning styles, cultural differences etc.).

External factors, often societal, may also contribute to the failure of language learning under the Bazaar approach. The following aspects were highlighted:

- Cultural bias, racism and xenophobia;
- Lack of cooperation with local partners and authorities;

- Characteristics of the target groups: previous educational experiences, resilience/self-reliance;
- Resistance to cultural integration (perceived as ‘acculturation’);
- Inadequate funding;
- Social exclusion /marginalisation (lack of inclusive culture in the hosting society).

The experiences and reports from the national ‘Bazaars’ around Europe indicate that it is possible to avoid the possible pitfalls and threats highlighted above by adopting the following processes:

- Meet the people where they are, meet and interact e.g. on the street, in shopping malls, on the marketplace. Create and use the borderless classroom!
- Undertake intensive user needs analyses and stakeholder/community consultations when planning the activities. Listen to their voice!
 - But don’t expect that learners express their needs easily! Sometimes you need to encourage them and try to dig deeper;
 - Take different interests and requirements of individuals and communities into account;
 - Build on existing skills and competences of participants;
 - Language skills within one group should not differ too much. This avoids frustrations and promotes a more stable learning process within the group.
- Build and secure cooperation and partnerships with local stakeholders, actors, organisations, institutions etc.
- Become acquainted with and respect the cultural differences that support language learning in particular and social inclusion in general.
- Encourage informal and collaborative peer learning rooted in daily life settings around life relevant topics.
- Arrange for suitable, comfortable, safe and learner-friendly learning environments.
- Build understanding and trust amongst leaders, peers, trainers, learners and surrounding actors (e.g. children of the learners).
- Involve community leaders and peers in promoting language learning:
 - Engage intermediaries i.e. peer tutors, mentors, coaches (mostly volunteers) in explaining and conducting language learning ...
 - ... however, ensure coaching and/or training of peer tutors, mentors, coaches before engaging them in the learning activities.
- Flexibility and focus on the learners are key, so make sure they are there in the:
 - Learning arrangements;
 - Syllabus;
 - Adaptable and customisable learning materials;
 - Learning processes;
 - Timing of activities;
 - Organisation of the groups.

- Learning objects, materials and processes need to be rooted in real life contexts and needs:
 - Development of tailor-made learning solutions by all involved in the learning process (User Generated Content);
 - The learning process is a mutual activity undertaken in partnership by peer mentors, trainers and learners.
- Encourage intergenerational approaches i.e. young family members and friends can help older learners, not only in acquiring language competences, but also with emotional support and motivation.
- Hard-to-reach learners such as migrants need more motivation and encouragement than other groups:
 - Provide effective feedback and support to learners.
- Language learning and 'learning-to-learn' goes often hand in hand:
 - Perceive language learning as a 'bridge' to more and deeper learning activities.
- Social engagement processes between trainers and learners might easily go beyond language teaching and learning:
 - Expect and try to integrate 'external' aspects (e.g. problems in daily life) into the learning process.



ONLINE TRAINING OF TRAINERS FROM THE OPEN UNIVERSITY, PORTUGAL

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Abstract

This paper describes an online training course for trainers in the perspective of new trends in online learning processes. Online training of trainers consists of: training as part of online pedagogical and teaching models, and not only on support and interfaces; discussions about teaching and learning in new scenarios; and online scenarios with the new trends on the development of e-learning in mind. The main purpose of this paper is to characterize the online teacher training course and its innovations within a paradigm referenced by networks, pedagogy of participation and the use of informal spaces in an innovative co-learning environment (Dias, 2012; Okada, 2011). We conducted a brief descriptive analysis supported by bibliographic references, reflections and discussions previously held about the proposal of the course. This paper is part of the work done by the course research team, who is developing a research project for improving innovation in e-learning.

Introduction

Technological progress and the advent of the Internet led to the emergence of a networked society marked by drastic changes in the economy and in the labour market, promoting the emergence of new paradigms, models, educational communication processes and new learning scenarios. Indeed, the relationship between technology and pedagogy substantially changed the paradigm to which we were accustomed, breaking with the tradition of a teacher-centred teaching as the “fountain of knowledge” and in accordance with a predetermined rigid curriculum (Monteiro, Moreira & Almeida, 2012; Anderson & Dron, 2012; Barros et al., 2013).

The introduction of ICTs in different scenarios of human activity, including training, has helped strengthen the design of working and learning methodologies based on cooperation among its members. The acquisition of such collaborative and cooperative skills is of great relevance and must be transposed into different areas, in particular to the labour market, since this is an extremely relevant competence that should be a cross-cutting trend in all walks of life (Dias & Osório, 2011; Aires et al., 2007; Barros et al., 2011).

Using online environments in training has demonstrated its potential. The idea is to now teach students to learn through motivational and flexible methodologies, which embody different teaching resources, dynamic and interactive contents, with different communication channels and ways of working. To achieve this, however, trainers must be able to effectively respond to the challenges placed by the introduction of ICTs. Specifically, by enhancing their skills and their teaching, pedagogical, and technological knowledge about human development (Moreira, Barros & Monteiro, 2014).

In short, to be a trainer in online training scenarios requires the acquisition of new skills, or the readjustment of others, while still paying attention to the more traditional ones. Thus, the aim of the online training of trainers course is to provide trainers with these skills within a framework of change and innovation, in which the Open University hopes to strengthen its position as a public higher education institution of quality and excellence. In this context, the “consolidation and anticipation of new networked learning scenarios” (referred to in the strategic plan of the Open University 2011-2015, (Dias, 2011), requires skills and requirements appropriate to the trainer in today's networked societies (cf. art. 3 of Ministerial Order 214/2011, of 30 May, and IEPF regulation).

Methodological Procedure

The main purpose of this paper is to characterize the online teacher training course of the Open University and its innovations within a paradigm referenced by networks, pedagogy of participation and the use of informal spaces in an innovative co-learning design. The specific objectives are to present the development of the course, its structure, elements, and innovative features, bearing in mind the importance of having research and practices that help us build benchmarks in e-learning in online training.

Based on this framework, we propose the presentation of an analytical study of the first edition of the course in several dimensions - instructional design, dynamics of the learning community.

The difference in this pilot course is that it draws on the open collaboration between researchers, and was a joint effort of the teachers invited to be a part thereof. Against this backdrop, we intend to contribute to the need to change paradigms in face-to-face and distance education and to personal training and development. To this end, the qualitative study, based on a descriptive analysis supported by bibliographic references, reflections and discussions, focuses on the results of the first course edition.

The interpretation of data was based on reference theory on education, e-learning, virtual teaching models, collaboration networks, and online teacher education.

Course pedagogical model

Teaching and learning activities of the course work take the form of distance learning, using an e-learning platform (Moodle 2.0 tailored to the virtual model of the Open University) and other environments and digital tools typical of Web 2.0. The course follows its own

pedagogical model, specifically designed for virtual teaching at the Open University, based on the following principles (Pereira et al., 2007):

- Teaching centred on the student, meaning that he or she is actively responsible for the construction of knowledge;
- Teaching based on flexible access to learning (contents and activities), with no time or space constraints, according to the availability of the student. This principle is underpinned by asynchronous communication, meaning that space and time do not have to coincide, since the student will communicate and interact as and when it is convenient, allowing him or her time to read, process the information, reflect, or dialogue and interact;
- Teaching based on diverse student-trainer, student-student, and student-resource interaction. This principle embodies various communication devices planned and designed by the trainer according to his or her pedagogical strategy;
- Education that promotes digital inclusion, understood as facilitating access to adults who attend a program in a higher institution and who have not yet fully mastered ICTS.

In this model, students are integrated in a learning community that offers permanent access to learning objects (script, audiovisual or multimedia), activities, discussions and exchange of experiences, and will have the opportunity to experiment with various tools and web interfaces. The coordination of each module is ensured by Open University teachers, who can rely on the help of other experts.

Course structure

The course consists of seven modules with a total duration of 150 hours (15 weeks of training), including an online ‘get acquainted with’ module for students. The following section provides a brief overview of the modules:

The online ‘get acquainted with’ module is an induction module for students, allowing them to become familiar with the university’s learning environment and pedagogical model, and with the skills required to be an online student.

The cross tools module is not intended for assessment, but will accompany the student throughout the course in the event of queries and requests for help on the use of software, applications and other web 2.0 interfaces used in other modules during the course.

- Module 1 will address the contributions of emerging pedagogical approaches based on Web 2.0, and contains some of the learning theories that support these approaches.
- Module 2 highlights some components and principles that are fundamental to the design of online courses, and i) must be focused on learning; ii) must be geared to achieve objectives; iii) should focus on meaningful performances and achievements; iv) should assume that the results can be measured in a reliable and valid way; v) must have an empirical, self-corrective basis; and vi) should be a team effort. At the end of

this module, students are expected to know the components and the key principles for designing an online course

- Module 3 analyzes the processes of communication and interaction, and individual needs of each student. At the end of this module, students are expected to analyze communication and interaction processes in online training contexts; to analyze the characteristics and specific features of technology-mediated communication; and to know about collaborative pedagogic, constructivist and learning models by detecting them in online training contexts.
- Module 4 aims to explore the potential and the pedagogical uses of some of the main tools of web 2.0, social networks, open educational resources (OER) and the possibility of establishing connections between the tools under analysis. At the end of this module, students are expected to know about and use web 2.0 digital-technological tools from an education and communication perspective; to know about social networks and the potential of games and multi-user virtual environments; and to understand the progress made in online training in customized learning environments.
- Module 5 addresses e-activities, which is the term usually applied to the active and interactive online training structure. The e-activities can be used in many ways, but have some common characteristics: i) they must be motivating and with well-defined goals; ii) they must be based on the interaction between the participants of a training course; iii) they must be designed and guided by an e-moderator; iv) they must be asynchronous; and v) they must be easy to arrange. In addition to these features, it is essential to address the different ways in which students learn, so e-activities must contemplate different strategies and activity formats. In this module, students are expected to design and develop e-activities in an online training environment.
- Module 6 aims to give a systematic view of the challenges, contexts and assessment practices in online training environments. At the end of this module, students are expected to analyze assessment concepts and their roles; to know about the implementation of continuous assessment practices, of collaborative learning assessment, the assessment of others, self-assessment, and co-assessment; to know strategies and use tools to implement online assessment practices in both formal and informal online environments
- Module 7 is built around the main axes structuring an online training project – planning, project design and development. At the end of the course, students are expected to be able to plan, design and develop an online training module.

The figure below shows the first course module, called the ‘get acquainted with’ module. The homepage features the learning contract icon, which contains the document that guides the entire learning process. Note that all course modules have a learning contract describing the objectives, skills, contents, resources, and assessment process. This learning contract is a key element of the Open University pedagogical model.

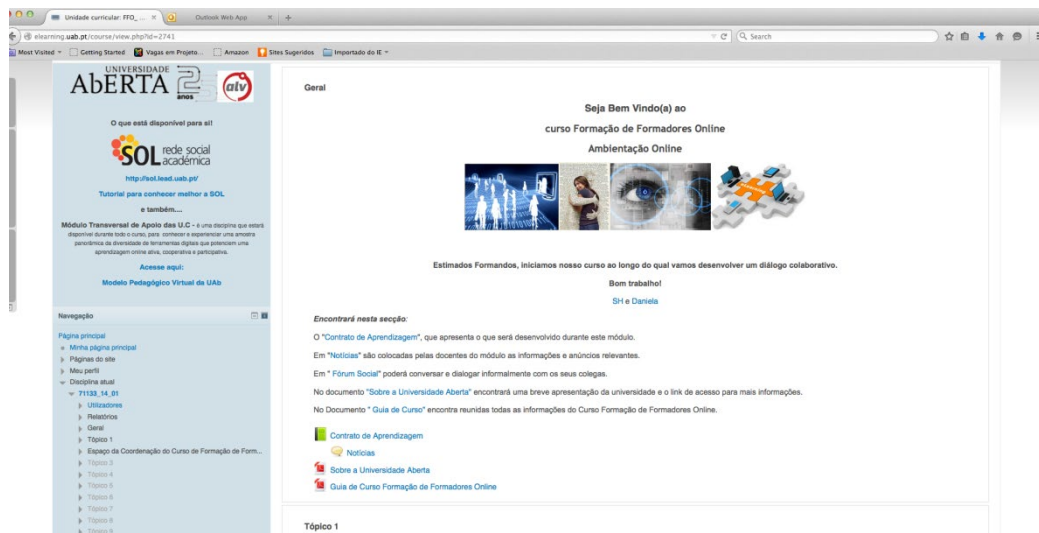


Figure 1. Image of the first course module – Get acquainted with

Each module was structured by an expert in the area, working for the Open University in the Department of Education and Distance Learning. Note that the pedagogical strategies build on the virtual model of the Open University, (Pereira et al., 2007), but are based on recent findings on investigations in the field of online pedagogy.

Benefits and challenges of course innovation

As mentioned before, the course is based on an innovative philosophy focused on the use of networks for the informal development of learning spaces. In line with this philosophy, an additional contact space was provided by the Open University as an academic social network that serves to encourage informal discussions seeking the production of knowledge, further to the modules designed for the teaching of contents.

To facilitate the shared and reflected collaboration of students throughout the course, we also encouraged the development of strategies and tools to promote collaborative work, enabling co-learning among students and teachers, as they are partners in the collaborative learning process, construction of meanings, and understanding and creation of joint knowledge.

In general, we can say that the pedagogical innovations in this course are visible:

- in how contents are organized and offered to students according to the goals and skills to be attained;
- in the interactions with web 2.0 and the virtual environment;
- in the mediated communication forums;
- in other communication spaces that facilitate a dynamic and collaborative organization, implemented in conjunction with the customized UAB platform - twitter, in the academic social network using Elgg resources, for example;
- in the student's critical review of what he or she is learning;

- in the co-learning between students and trainers, supported by a pedagogy of participation (Dias, 2008; Dias et al., 2008; Dias & Osório, 2008; Dias, 2012; Barros, 2012; Goulão, 2012; Okada, 2012).

Final Considerations

The advantages of these innovations offered to students are yet to be assessed, as the first group has only recently completed the course. The most relevant challenge for teachers, however, was that the change in strategies and online tools has indeed enabled collaborative and co-learning spaces.

This paper begins with a brief description of the proposed online training course for trainers its innovations within a paradigm referenced by networks, pedagogy of participation and the use of informal spaces in an innovative co-learning environment.

We then conducted a brief descriptive analysis supported by bibliographic references, based on reflections and discussions previously held about the proposal of the course. The results are part of the rationale for course improvement and its ongoing research.

The course research team working on the improvement and innovation of e-learning will shed light on the progress and possible ways of improving the quality of these courses and of promoting innovation.

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EMBEDDING DIGITAL COMPETENCES IN THE CURRICULUM: A CASE STUDY ON STUDENT-EXPERIENCE OF AN ONLINE TECHNOLOGY-ENHANCED, ACTIVITY-BASED LEARNING DESIGN

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Introduction

The purpose of this paper is to evaluate the student experience of an online technology-enhanced activity-based learning design that has been developed to facilitate the embedding of digital competences in the health education curriculum. Previous work has shown that digital literacy can be identified as the collection of digital competences and skills that can be measured (Evangelinos & Holley, 2014b); however the qualitative interpretation of the results was standing on a complex, highly individual profile for each participant (Evangelinos & Holley, 2014a). The conceptual model for curriculum development is founded on the premise that technology-enhanced, activity-based and collaborative learning (Goodyear, 2001) interventions should become an integral part of the curriculum design and delivery as there is wide consensus on the increasing trend of using digital technologies in all professional and employment sectors (Didero, Husing & Korte, 2009; The Economist, 2014) including health and education. Digital skills are the most transferable skills (Balcar et al., 2011) especially relevant to life-long and life-wide professional development (Figel', 2007). Literature in general, widely supports that within education, the communication of knowledge has drastically changed because of the fast rates of development of digital technologies and the associated implications upon society (Hanna, 2011). Digital proficiency is acquired; therefore, it should be measured in the context of specific tasks.

The intervention was delivered via the institutional Virtual Learning Environment (VLE) by means of eight online study activities. The content of the activities was based on aspects of the existing curriculum but each activity introduced elements of digital competences identified by the European Union Digital Competence (DIGCOMP) framework (Ferrari, 2013). The nature of digital competences and the delivery mode of the module necessitated the embedding of digital skills within the curriculum so as to make them relevant for incorporation into the existing study programme for two equally important reasons: i) the students should be able to develop the digital skills needed for successful studies; ii) there is evidence that digital skills are best 'embedded' in the 'normal' curriculum and should not be offered as a separate training course difficult to relate to and incorporate into the students' busy workload (Leeds Metropolitan University, 2011; Thomson et al., 2014). The purpose of the case study was to pilot a Learning Design (Dalziel et al., 2013) activity-based approach for embedding digital

literacies in the curriculum and assess the student experience of undertaking technology-enhanced learning activities. The curriculum development model and the digital competence framework used to map digital literacy are transferable to different disciplines.

Methodology

The technology-enhanced curriculum intervention was offered to 102 first-year Midwifery students and was delivered via the institutional VLE through eight electronic activities following Salmon's (2002) 'e-Tivity' model. The research schema comprised of eight sessions starting with a pre-course questionnaire, six technology-enhanced learning interventions and the final session focussed on reviewing the student experience through short reflective diaries. The intervention was part of their first study module that was selected because of the suitability of its scheduling and the enthusiasm of the module team to experiment with technology-enhanced learning designs. The selection of a first-year module was purposeful as it alleviated concerns around student preconceptions of what a standard 'face-to-face' delivery should entail. Since the intervention was offered as an add-on, it was delivered via the institutional VLE in a blended-learning fashion utilising an activity problem-based approach in addition to the scheduled content of the module because of restrictions imposed by the institution's module validation and quality assurance processes. At the time of the intervention the module was taught by a number of tutors under the co-ordination of the module leader in two different campuses. In order to maintain parity of the student experience two student groups were formed based on the geographical location of their studies. Both groups were given exactly the same information and were subjected to the same research protocol. Explanations of all the ethical considerations regarding confidentiality of collected data, anonymity of the subjects and ownership of the study were transparent; informed consent in writing was provided by the participants who were given the choice of participating anonymously, withdrawing without penalties or even dictating conditions on the use of data.

The first activity required the students to answer a bespoke self-assessment questionnaire (Evangelinos & Holley, 2014b) that established the digital-competences potential across the groups and highlighted areas of interest. The toolkit, comprised of the twelve digital competence areas identified by Janssen and Stoyanov (2012), allowed the creation of group digital competence 'maps' used to quickly identify areas of interest. The six activities that followed were technology-enhanced e-tivities aiming to deliver different aspects of digital competences by presenting short problem-based tasks on midwifery-related content. These tasks had to be researched, compiled and presented electronically and required the utilisation of a variety of digital skills. The last activity asked the students to report reflectively on their experiences of undertaking the learning activities with respect to developing their digital competences by keeping a short reflective diary that was completed by 20 students (19% participation rate). A grid of the mapping of the eight e-tivities against the twelve digital competence areas can be seen in Table 1 below.

Embedding Digital Competences in the Curriculum: A Case Study on Student-Experience of an Online Technology-Enhanced, Activity-Based Learning Design

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Table 1: e-Tivities Mapped against the early version of the DIGCOMP Framework Digital Competence Areas

E-Tivity / Digital Competences	1. General knowledge and functional skills	2. Use in everyday life	3. Specialized and advanced skills for work and creative expression	4. Technology mediated communication and collaboration	5. Information processing and management	6. Privacy and security	7. Legal and ethical aspects	8. Balanced attitude towards technology	9. Understanding and awareness of the role of ICT in society	10. Learning about and with digital technologies	11. Informed decisions on appropriate digital technologies	12. Seamless use demonstrating self-efficacy
01	✓											
02												✓
03					✓							
04			✓									
05										✓		
06				✓								
07											✓	
08	✓											

The student experience and the impact of the interventions were documented by conducting two focus groups, one for each location, that were attended by 32 students (31% participation rate). The focus groups were conducted in a semi-structured approach by projecting a presentation onto the screen with questions prompting the students to elicit answers, thus maintaining concentration on the key questions. The students were encouraged to comment as they pleased, elude and/or expand to any other relevant areas. The discussions within the focus groups were recorded, transcribed and analysed through the use of QSR NVivo software. The analysis was conducted by coding the focus group corpora and the reflective diaries into themes following Glaser and Strauss' (1967) Grounded Theory approach and the coding recommendations from Miles and Huberman (1994) and Guest et al. (2012).

Results and analysis

The evaluation of the student experience was carried out through the analysis of short reflective diaries produced by the students when asked to report reflectively on their experience of undertaking the learning activities with respect to developing their digital competences. Two semi-structured focus groups were conducted to capture the participants' most prominent thoughts and feelings. The diaries and transcribed focus groups were studied through thematic analysis that involved the coding, refining and summarising of emergent concepts into categories and themes. In the analysis below only the themes mentioned by most ($n > 10$) of the participants were included as representative of the majority of the views of the participating student population. The stacked bars in Figure 1 below correspond to references to each theme extracted from the focus-groups (FG) discussions and the reflective diaries (RD). The 'ticks' on the line labelled 'Sources FG and RD' that is running across the themes denote the relative 'power' of each theme measured by the number of participants that made a reference relevant to the theme.

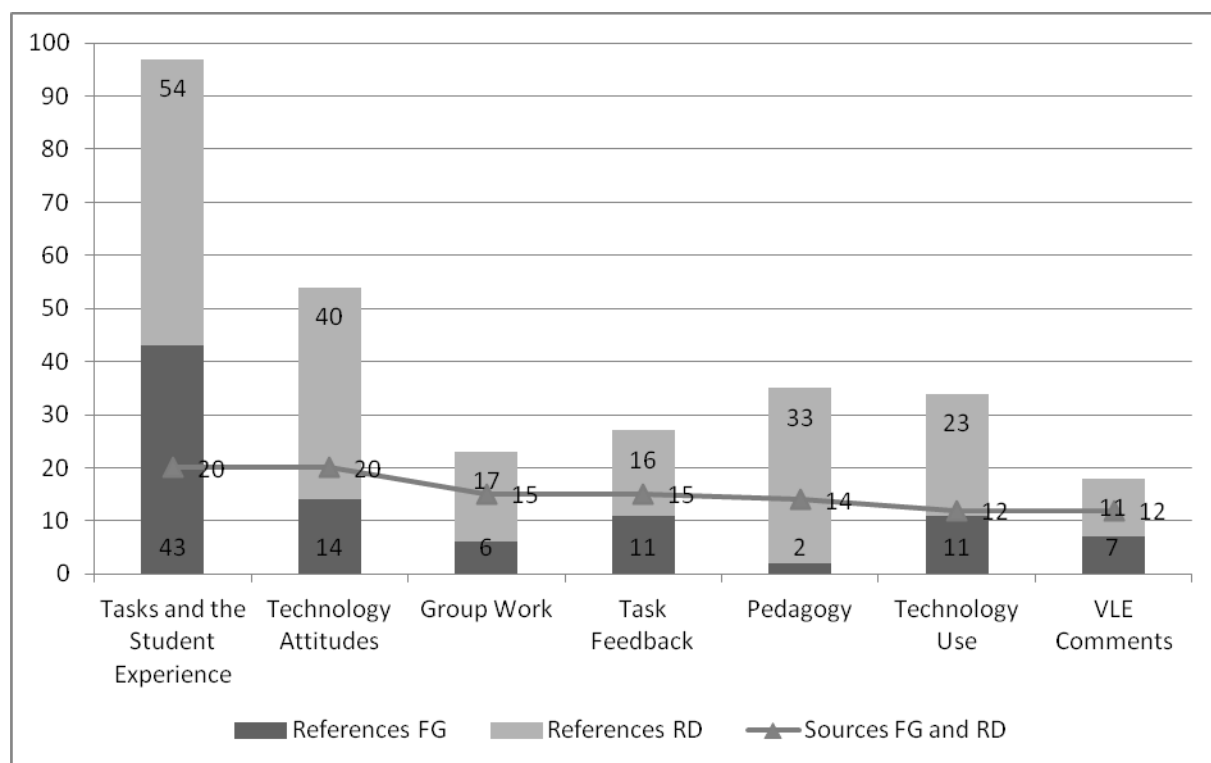


Figure 1. The Focus Group and Reflective Diary Themes

The participants found the tasks interesting and enjoyable and felt that the tasks motivated their learning, allowed them to learn at their own pace remotely, minimised the need for travelling, allowed them to revisit the material at any time and enhanced their digital skills and confidence. They liked the use of multimedia such as videos and interactive learning objects rather than the usual text-based resources and the 'loose' deadlines imposed for the completion of the tasks. A significant minority of participants liked the honing of self-directed learning skills that made them feel more capable, independent learners and cultivated their research skills. A small number of participants felt that the activities did not really enhance their digital skills as they were not stretching enough. Less technically able students found some of the activities challenging. The majority reported that they gained or refreshed existing skills by completing the activities. The online delivery of the activities was described as distracting for some participants who preferred a more instructional approach rather than the self-directed learning of un-facilitated online activities that caused confusion about the depth and breadth of the detail needed for the completion of the tasks. This aspect was also identified through comments on the variety of the learning resources and in particular the varied levels of difficulty some activity resources presented. It was reported difficulty in managing the study-schedules due to competing commitments such as summative assessments and other placement responsibilities.

The attitudes towards technology were fairly diverse having the same participant reporting positive and negative experiences. A number of them reported a realisation of the increased communication channels offered by technology, elevated self-awareness and an appreciation for the impact of new technological developments such as social media. Some participants

Embedding Digital Competences in the Curriculum: A Case Study on Student-Experience of an Online Technology-Enhanced, Activity-Based Learning Design

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enjoyed to be taken out of their comfort zone through challenging tasks but others felt less comfortable especially when they realised that learning technological skills could be time-consuming and were worried on the impact this might have on their already busy schedules. Concerns were raised in the broad assumption that using technological systems in healthcare is always time and effort efficient where some participants reported experiences about the opposite. The availability of technology does not readily result in its increased use especially when technology is to be used in demanding or difficult situations. The importance of training and support for the use of technology was emphasised by extensive consensus.

For the provision of feedback on the tasks the participants expressed strong views. A number of them reported positive experiences of receiving meaningful, positive and timely feedback; however, there were inconsistencies across the groups as some tutors took a lot longer to reply. Some participants did not like the lack of a direct way of acquiring feedback on the tasks other than emailing the tutors. The participants requested for examples in the belief that these could make it easier for them to understand the nature of the type of work required.

The students greatly appreciated group work as it allowed them to get to know their peers and share their knowledge and skills; it facilitated the exchange of ideas and approaches and generally it was characterised as an enjoyable experience. Peer group exchanges on the various topics studied were also well received as people recognised the benefits of sharing the knowledge and research results across the different groups. Networking and socialising with their colleagues was also well received and the group-work tasks were seen as an ice-breaker that allowed people to meet and socialise in a more direct way. Team-formation dynamics were identified when people were asked to work together. Some groups decided to equally share responsibilities while others assumed a management model where roles were negotiated and leaders, managers and workers were identified. A small number of participants reported that they found group work difficult because they lived far away from the university campus and group meetings involved extra travel but otherwise they found the experience of engaging in meaningful study-tasks positive.

From the pedagogic perspective, participants found that the activities developed their information and research literacies as they encouraged them to search through multiple channels of information dissemination and critically evaluate the appropriateness and credibility of the sources. They chose resources relevant and suitable to their own learning styles as some preferred to learn by utilising audio-visual material rather than text-based resources. Self-directed learning blended with instructional approaches seemed to work well for some of the participants evidenced by the self-actualisation of the learning processes and, in one case, a transformation from inexperienced to confident student through self-directed study was reported. Some felt a bit uncomfortable with the use of perceived non-authoritative resources and they would prefer a standardised list of tutor-reviewed and approved resources. The activity of creating their own mini questionnaires around a topic made them consolidate their knowledge and double-check their understanding although some were not confident enough about the quality of their produced outputs.

The reported technology use involved the utilisation of digital devices such as desktop and laptop computers, mobile tablets and telephones, and a variety of software packages. The participants were primarily concerned with either not acquiring enough of the technological skills or getting too involved in technology rather than in the content. Some experimented with using technologies more creatively to deliver the tasks but they reported that when they started feeling the pressure of their other studying commitments they quickly reverted to using the technologies they were already familiar with, thus losing the opportunity to broaden their skills. Some felt intimidated by the quality of work their more technically able peers had produced. Many pursued the help of digitally competent friends or relatives to learn how to use a piece of technology. Some reported they struggled for completing the tasks from a technological perspective but, nevertheless, they did their best to complete them.

The Virtual Learning Environment (VLE) was reported as easy to use and a great tool for accessing the module resources, collaborating, sharing and reviewing the work with their tutors and peers. Others initially found the VLE difficult to use but this was overcome after they were shown how to use it. A significant number reported problems when dealing with video files on the VLE, but investigation proved that this was down to technical limitations of the system. Some usability issues were also reported when trying to connect with the VLE via mobile devices as the system was not optimised for the smaller screen sizes and the lack of mouse and keyboard inputting devices. Overall, most students coped well with the system, felt supported when things went wrong and found undertaking this kind of online activity-based learning on the VLE genuinely useful and suitable to their learning style.

Discussion

The digital competence self-assessment toolkit was used to baseline the overall level of digital competence of the group but it was not used to develop the activities as the decision on the content of the activities had been made prior to administering the questionnaire for reasons of practicality, imposed by the nature of this pilot project, and because the university procedures at that time did not allow for agile course curriculum redefinition and redevelopment. The digital competence maps were used to baseline the average competence level of the group.

Due to restrictions imposed by the piloting nature of the project two more factors that influenced the student experience need to be carefully examined: a) the lack of protected time within the curriculum delivery to undertake the activities and b) the lack of an accreditation scheme. The same also affected indirectly the tutors' available time for providing feedback, which is another major concern recorded by the students. Potential solutions to address these major concerns are: the embedding of this type of activity into the normal curriculum delivery from the design stage so as to integrate it within the available time, and the use of formative and summative assessments to accredit the effort, acknowledge participation and, most important, to ring-fence/allocate tutorial time for marking and feedback.

There is need the curriculum content of the activities and the embedding of digital skills to be balanced carefully so as to ensure that the benefit of acquiring sufficient 'technological competence' is not gained on expense of the actual-learning content. The mapping of the potential technology-enhanced learning interventions against the curriculum content and the digital skills should be considered carefully in order to balance the informative with the other activities that deliver the wide gamut of digital skills required by modern healthcare professionals. The wide variation of digital skills and competences among a group that includes complete novices, competent users and expert individuals complicates the task of making the technological perspective interesting and challenging without rendering it too difficult or even out of reach for a significant number of people. There was also agreement in that the participants would have liked informal training and support in order to acquire or enhance their digital skills.

The analysis of the reflective diaries and the transcribed focus-group corpora falls within the qualitative research paradigm; therefore, it can only be characterised as an interpretation of the views of the participants, summarised at group level to elucidate the general group trends and opinions. In order to strengthen the validity of this type of analysis only the themes mentioned by the majority of the participants have been presented. The relative 'power' of each theme has been determined by counting the number of references that have been grouped under the identified themes mentioned by the participants and the number of individuals reporting on a theme.

The most prominent criticism concerned the online activity tasks and the perceived lack of clarity on the depth and breadth required for successful completion. It is interesting to note that these comments referred to the contextual content and not to the technical aspects of the activities. Consideration of whether the activities should have been more prescriptive was given prior to the intervention but the module leader decided to loosely define the activities so as to allow for flexibility in their interpretation. As this was the first time of piloting this type of intervention the module leader did not want to impose strict criteria and inhibit the creativity of the students. The level of knowledge and the digital competence of the individuals were unknown at the time of preparation of the pilot and a strict definition of the tasks could render participation in this intervention very difficult for the less able or uninteresting for the competent students.

Concluding remarks

The results showed that participants overall evaluated the interventions as interesting, worthwhile and useful for their learning. Improvements that could enhance their overall experience were: personalisation and flexibility at the curriculum-content level and digital-competence skills to ensure that every student enjoyed the maximum benefit, irrespective to their starting competence point.

This case study should be of interest to anyone that would like to enrich their curriculum offering by embedding digital skills into the curriculum design and delivering technology-enhanced, activity-based learning that has the potential to increase student engagement and enhance the student experience. Moving forward this process should be rationalised as a quality enhancement procedure that can be utilised by academic professionals working with large groups of students across a variety of disciplines.

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Embedding Digital Competences in the Curriculum: A Case Study on Student-Experience of an Online Technology-Enhanced, Activity-Based Learning Design

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METHODS FOR E-EVALUATION OF BULGARIAN DISTANCE STUDENTS IN LIBRARY AND INFORMATION SCIENCES

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Introduction

During the period 2013-2014 with the financial support of the Operational programme “Human Resources Development” the State University of Library Studies and Information Technologies in Sofia implemented a project on the introduction of Internet-based distance learning at master’s level at the Faculty of Library Sciences and Cultural Heritage. Since inauguration of the project, a special attention has been paid on the methods for electronic evaluation of the students’ achievements that would be applied in the master’s distance-learning programmes of the faculty. The current report presents the results of the analysis made in relation to the defining of the electronic evaluation approach and the type of the test questions, applicable by means of the platform for e-learning ILIAS used at the university.

Advantages of the electronic assessment

In the universities the testing and the evaluation of the students’ achievements is an inherent part of the training and can be defined as a systematic gathering of information about the learning of the students as well as about other variables related to specific knowledge and experience. This process is generally accomplished by means of different evaluation methods and instruments, the most widespread among which are tests (Mintzes et al., 2005). Regardless of their type, they are an essential element of the training, in particular of the e-learning and are an important instrument for measuring the progress of the participants in it. Together with the rest of the activities in the web-based courses, they give the trainees the possibility to demonstrate the knowledge and the abilities they have acquired. Web-based tests lead to results, similar to those of the traditional exams, but take less time for preparation, conduction and analysis of data. Tests realized by means of the Internet do not require expenses for printing and distribution and to each test answer is given a definite number of points. Thus the final result is calculated automatically. The resources saved are multiplied proportionally to the number of the students who sit the exam at a distance.

Determining the evaluation approach

It is advisable that the elaboration of a given test to begin with definition of the reasons for its conduction. Thus, the scope of the material on which the test will focus will be more accurately defined. Testing the knowledge of the students must not be based on the presumption that each training course requires regular conduction of tests as well as that tests

are the only possible proof for the management of the training institution for the effectiveness of the course. Some of the motives for application of tests can be defined as useful for the students – for example the possibility for them to measure their progress according to the purposes they have set for themselves. Tests allow the trainer to focus on the most important information from the learning material and to turn the attention of the students toward it as well as to measure their results in the middle of the course. Thus, if there are any problems, the way of presenting the learning content can be optimized in due time. The conduction of tests is useful in cases when it is necessary to be certified that the trainees have mastered certain skills.

When planning electronic test it is important to be determined what exactly will be measured with it as well as to reconsider the purposes of the training according to the exact part of the learning material which will be used as a base for the evaluation. It is necessary that the trainer defines for himself what exactly he or she is teaching the students – knowledge, skills or way of thinking as well as what facts, knowledge and skills he/she expects to be mastered by them. The attitude of the university teacher towards the knowledge that will be evaluated by the test must be determined also by the fact whether the students study consecutively the learning material of the course or skip certain parts of it. Another important aspect of the process of elaboration of a strategy for examining the success of the students is the decision about how the mid-term test will be treated and to what extend it will influence the final grade. In some cases it is possible the mid-term testing to influence positively the motivation of the group of trainees. The good approach towards evaluation depends above all on the good communication with the students and the understanding of their attitude towards the training (Horton, 2000).

Defining the types of questions in the electronic tests

After the approach in e-assessment is defined the type of questions and the method used by students for answering them is important to be specified. There are different variants of test questions as each of them stresses on specific knowledge and qualities to be assessed: e.g. the knowledge of facts or the visual memory of the examinee. When the test questions are chosen it is necessary the aim of the test to be taken into account by the trainer.

Among the most widespread types of test questions are those with structured answer. The following kind of questions can be outlined here: with alternative answer (yes/no; true/false), multiple choice questions and matching questions (Тупаров & Дюрева, 2008). It is typical for the questions with alternative answer the students to choose among two mutually exclusive answers of two questions. They are used for testing students' abilities to make explicit judgments.

The trainees have to take a decision on whether the specified statement is true or false; whether a certain procedure works or does not work; whether the relevant procedure is unsafe or safe; whether the specified example meets the stipulated standards; which of the two alternatives should be chosen, etc. Questions which offer alternative answers require simple

and clear wording, as well as correspondence between the kind of question and its answer – for instance, it would not be correct to combine questions, containing “yes” and “no” with answers such as “true/false”. Prior to their usage into ILIAS e-learning environment, it is important to analyze the possibility of including another type of questions into the tests, because the choice between two alternatives is limited to simpler cases and it could lead to a result when students only make assumptions, without knowing the answer. Nevertheless, in case the questions are asked in a way which implies the same mental process as if applied in real life, this would bring more advantages to the trainees, than, for example, the process of applying of three-dimension game simulations which make the participants use only their decision-making skills. It is recommended that more than one question of that type is included in a certain topic, so that the tests containing questions with alternative responses turn out to be effective. Thus, the probability of giving a correct answer on a random basis is decreased. For achieving the same result, the questions with alternative response to each different topic of the test have to be asked in such a way that in some cases a certain answer corresponds to the wording “false”, and in other – to the wording “true”. It is also important that neutral terms (such that do not offer a hint to the answer) are asked.

A distinctive aspect of the other basic type of questions with structured response – those with a response to be chosen – is that the trainees are provided with a list, from which they are expected to choose the relevant correct response. There are two main types of this kind of test questions. The first one requires that students choose one true response out of several alternative answers to each of the questions. The questions requiring selection of one true response are appropriate when it is expected that objects are associated with well-defined categories. The following main cases can be pointed out: defining of digital assessments; identifying of members of certain groups; recognizing of one possible reason for a given problem amongst other possible reasons for the same, as well as defining comparison stages. Upon applying of the second type of questions with an optional answer, the trainees choose one, several, all, or none of the given alternatives to an answer. The tests with several true responses allow phrasing of more complex questions compared to the tests with alternative answers and those with one true answer. They require that the students undergoing the test make associated estimations. Most common of all are those cases when students have to choose elements responding to a criterion stipulated in advance; to assess in what cases a certain rule has to be applied; to take a certain number of confirmative or rejecting decisions and to point out examples corresponding to or not corresponding to a given principle. As for the design of the tests in the system for e-learning of the State University of Library Studies and Information Technologies, the questions with alternative responses are usually the following: all possible answers are listed, and the correct ones are marked by the students undergoing the test; the alternatives of a response are visualized via a drop-down menu, from which the correct answer is to be chosen. The students might be given an opportunity for choosing between several visual alternatives, represented with pictures. Although they are easy for construction and understanding, the multiple-choice test questions can tempt the learners to guess rather than to reason. In using the questions with several true answers, for example,

the trainer can counteract this by increasing the options for answer or the number of true answers.

The third type of questions with structured answer used in the elaboration of tests in the e-learning platform ILIAS are the matching questions. In this type of questions there are two synchronized lists and the students have to relate the list elements on the basis of relation criteria. The matching questions are suitable for evaluation the knowledge about the relations between objects, concepts and components (Kraiger & Cannon-Bowers, 1995). They are not limited only to text lists – graphic elements can also be used for determining the correlations. These types of questions are useful for the students in the process of specifying the relation between concepts and definitions; between images and inscriptions; between personalities and titles; between instruments and their purpose; between an element of the whole with another element of the same whole, etc. When creating the matching questions test it is necessary the elements from the two lists to be clearly formulated. For that purpose well-known terms should be used and if there are specific terms – to provide access to electronic dictionary. It is also important the lists to be short so that to be possible to be seen on one screen as well as the students to be able to specify the correlation without writing certain letters or numbers. The e-learning system allows the students to choose the correct answers by using a drop-down menu, to move objects from one list to another and to draw a line between the correlated elements of the two lists. For creating effective matching type test questions it is advisable to neutralize the possibility for “guessing” by including more elements in one of the lists than in the other.

The following type of questions can be counted to the matching questions as well: those suggesting answer through dragging and dropping objects (icons and images) to specific places on the screen, and those requesting from the examinees to answer by indication on a picture. The first type of test questions is used to check the skills of learners to classify objects and elements in different categories and to organize the parts of a system in one entirety. These questions are used in assignments for indicating the names of objects into the corresponding places in a graphic or scheme; classifying objects by dragging the images in boxes, representing specific categories; grading different conditions of items by sliding them to the related positions in the scale; ordering parts of a whole by putting them in the correct positions, in which they are one to another; indicating the closeness of links among a family of objects through the way they are positioned, etc. The most difficult part of designing test questions requesting answer through dragging and dropping items is the information clarifying to learners how to start the working process. It is important the objects on the screen to be described with a text as well as to be pointed out which of them can be moved by the examinees to the existing gaps. It is also necessary to emphasize on the items for displacement and to the boxes in which they will be put as for them a distinctive graphical style is chosen.

In the questions requiring an answer by choosing an image, the trainee has to select an object or a section of an image with the button of the computer mouse. The e-tests based on such questions are used for examining the ability to visually recognize objects or parts of objects

from a particular system. It is recommended to use tests requiring an image selection answer instead of multiple choice test questions when it is more important the students to learn where the object is situated and how it looks like rather than its name. When such tests are being elaborated, it is crucial to use images of good quality and to give clear instructions. The objects for selection must be big enough and visually separated from the rest of the space by clear outlines. It is also necessary to specify what exactly the student should select – an area, an object, a point from a scale or something else. When simulating different activities by clicking of buttons on the toolbar the screen has to reproduce the situation the way it would look like in real life.

Through the closed type of assignments the learner operates with an entirely defined structured situation in which the evaluation is objectified to a maximum, the learning content can be fully covered and an accordance with the aims of measurement can be achieved (Ангелова & Радев, 2010). The testing is relatively fast, therefore the questions with structured answer are preferred by the trainers in designing tests for the purposes of e-learning.

The questions which require text input are in the category of the open questions. When answering, the student has to write the right answer in a certain field. Normally this would be a short answer to very specific questions. The e-tests based on this type of questions are used for examining whether the students have learned the names of different things (abbreviation, technical or business terms, foreign words, commands and rules in languages for programming, parts of numbers, etc.). The greatest difficulty in the creation of such tests is formulating the question in such a way that would permit an automatic evaluation of the answer by the computer. The basic principles to which the creators of such tests in the State University of Library Studies and Information Technologies should comply with are the following: the question to be posed in a way which limits the possible right answers; the question to be formulated in such a way permitting the answer to be evaluated on the basis of the presence or the absence of certain words or phrases and not on the basis of a particular word order or syntax; the checking system must accept synonyms, grammar variations and common spelling mistakes. It is necessary the examinees to be instructed most correctly how to formulate the answers as well as to be clarified whether the answer to be text or a combination of text and numbers. If the question is complex it is advisable to be divided into several questions each one of which requiring a short answer. The trainees must also be informed about the length, form and the compulsory parts as well as about the existing limitations in the form for text-input. Although the automatic evaluation of the freely formulated text is, in most cases, not very practical, the questions can be formulated in a way permitting the evaluation of the completeness of the answer. It is also important that an automatic validation of the answer to be included in the e-test. For instance, in the cases when the answer must be in numbers and the student gives a “word” answer the system must reject the answer and require a correction of the answer. This would help to avoid situations in which the student knows the correct answer but because of his incorrect text input the answer would be considered incorrect.

Other types of tests with open question applicable in the e-learning environment ILIAS are those related to text or a table with blank spaces in which the student must fill in the missing word or elements. They are used mainly for measuring the abilities of the students to apply their knowledge in the frames of a contextual matrix, i.e. evaluation of their abilities to find the correct answer using certain given information. The basic cases of application of e-tests requiring filling in blank spaces are: when examining partial knowledge; for measuring the ability to apply verbal knowledge in a context as well as in questions which encourage the students to reach the correct answer from the context. Such tests are also used for posing complex questions to which the students answer by many interrelated parts as well as for ensuring with the context of the support needed by the students in the initial phase of the learning of certain subject or theme. When elaborating this kind of tests it is important that the trainees are introduced to the context of the question by explaining where the incomplete example comes from and what is its purpose. The criteria according to which the blank spaces have to be filled must also be clarified and if there are too many alternatives it is advisable to use a list from which the students to choose the correct answer.

Simulation based tests involve accomplishment of highly interactive tasks. The simulators used enable the implementation of definite procedures. Rather than assessing the students' abstract knowledge on a given subject, the simulations estimate the student' skills for performing complex activities (Davidovitch et al., 2008). In case the students carry out an assignment via the simulator, they pass the test and are therefore supposed to be able to implement real-life activities. Simulations are expensive and take much more time for development compared to other instruments for knowledge assessment. They are used as tests in cases when the procedure undergoing examination is a more complex one and requires decision-making behaviour by students, rather than just following pre-defined steps in a row. They are also applied in cases when timely implementation is of great importance for the successful accomplishment of a task, as well as upon training of students for carrying out of activities in real life. Using an appropriate simulation for the assessment of a specific aim is the main characteristic of a good simulation test. The simulation has to be simplified. The students do not have to be offered more alternatives than a number of choices which would prove to be sufficient for the particular aim assessment. The purpose of the test has to be clearly explained to the students; timelines have to be clearly set and stated, and information should be provided to them for the existing restrictions. It also has to be specified whether the use of specific methods or means is required for the accomplishment of the assignment. The simulation way of functioning has to be explained well to the participants. It has to be clearly described how it differs from the real system (by listing the restrictions of the activities that could be undertaken by the students; by explaining which of the aspects that are dangerous in real life are safe in the simulator, and by specifying whether any of the existing functions and possibilities have been excluded). The trainer has to also clarify if the end assessment of the simulation test is influenced by the quantity of the job performed, by the timelines of the job's accomplishment, and by the number of the activities undertaken for the purpose of the job implementation.

Improving the electronic assessment quality

The tests are developed not only for the purpose of checking and assessing the knowledge of students – they contain a potential for additional training. That is why the adequate feedback and assessment are a significant part of the overall success of the training process and assessment. Materials revealing the source of the true answer can be offered in addition to the explanation why a certain answer is not correct. It is extremely important that a neutral language is used upon pointing out a wrong answer, so that the student undergoing the examination does not feel offended. The encouraging comment upon receiving a negative result would motivate the student in further proceeding with her/his training.

The constant update and improvement of web-based tests is a compulsory responsibility for all teachers. Thus, the information would always be up-to-date, and solutions for all issues identified during the test process would be searched for. The methods that could be used for upgrading of the tests are as follows: results monitoring, aiming at analyzing the test degree of difficulty and up-to-date status; obtaining trainee feedback regarding the quality of the test (before and after its implementation), changing the type of questions, etc.

Conclusion

The electronic assessment tests help not only students, but also teachers, for reaching a higher level of development and realization into the training process. They improve the training's effectiveness, while contributing for gaining more complete and sound knowledge, by stimulating of a creative and scientific active work process, by contributing to the streamlining of the training process, and turning it into a process which is truly pleasant for the trainees (Ненов & Алексиева, 2006). The conclusions of the performed analysis are specified below. This analysis has aimed at determining the approach to be used during the electronic assessment, as well as at determining the types of the test questions, which are to be applied by the teachers in the distance master's programmes of the Library Sciences and Cultural Heritage Faculty at the State University of Library Studies and Information Technologies. Despite the conveniences offered by the tests for checking and assessing the students' knowledge into the e-learning environment ILIAS, they impose some restrictions and could not always be considered the most appropriate method of estimating the students' development. That is why, talking about web-based courses, it could be recommended that the university teacher also offers alternatives of the formal tests, which could assess the students' individual achievements – for example – a combination of different instruments for measuring the progress reached by the group of trainees (research projects, strategies for active training, etc). Instead of checking the acquired knowledge via a test, the students could be encouraged to gather actual evidence for their training into an electronic portfolio, documenting the job carried out during the course. The portfolio consists of samples of different products or materials which are appropriate for immediate implementation into working environment (Lorenzo & Ittelson, 2005). Apart from the portfolio and the different kinds of tests (tests for self-assessment, tests for groups of trainees, etc.), the university teacher could also apply simulations or role-playing games as methods for assessing the students'

performance. Being part of the active e-learning strategies, they are exercises related to playing particular roles into a virtual working environment.

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TEACHERS' IT TRAINING AS AN IMPORTANT ELEMENT IN EDUCATIONAL PROCESS

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The inevitable internationalization of the higher education on the one hand and constantly changing situation in the Russian economy on the other have illuminated new challenges for the educational system. The transformation of universities into big centres combining education, research and innovation fully complies with the government's concept of innovative development of the economy of the Russian Federation, aiming at making it more dynamic and knowledge-based. The focus on students with a broader view on the potential problems, with globally competitive skills and the ability to work with technologies that are not only rapidly changing, but might not even exist in the present day world, is becoming a growing imperative for the educators. These tasks brought about the necessity to elaborate new educational standards which, in its turn, has encouraged the creation of new teaching methods and technologies with the emphasis being placed on the information communication technologies (ICT).

In the modern society, information communication technologies are becoming the basic tool, dominating at all stages of educational process, starting at school and lasting through the whole life, making it possible to enhance skills and knowledge continually to adjust to new environments. However, it is generally accepted that the quality of learning may suffer when a student has to self-organise his/her work with ICT. The student should not only feel secure with the software, but also possess certain qualities such as will and self-discipline. The impact of the teacher's personality with his/her high qualification, experience and profound knowledge of the subject decreases, if compared to traditional education. So the quality of electronic teaching resources, as well as the ability of a teacher to organise interactive communication and to support the learning process in general, tailoring it to the needs of individual users and groups are critical to the success of such way of learning.

Background

The Faculty of Distance Learning (FDL) of Plekhanov Russian University of Economics has been involved in providing different programmes, based on ICT, for more than a decade. This ranges from the fully-fledged Bachelor and Specialist Degree distance education to short-term vocational training and upgrading courses, and consequently great experience in designing and developing educational digital resources has been accumulated. However, today's full-

time 'digital' students also expect their education to include technology, as they have become inseparable with their gadgets and devices. So the need to adapt and integrate ICT into the traditional education has become increasingly apparent. But blended learning requires new competences from the teachers and also their close cooperation with programmers and other technical staff. That leads to changes in traditionally individualistic academic culture bringing about the necessity to work in teams, allocate roles and responsibilities for the courses design, teaching and assessment.

Different e-learning environments provide students with enriched learning opportunities, extending learning beyond the classroom and helping to personalise the educational process. However, the survey conducted by FDL has identified that only a small number of teachers use the full capacity of the e-learning platforms for the interactive communication with students. Teachers mainly use them to deliver information, such as manuals, lectures, presentations, etc. The next most-spread activity is to supply students with references for additional sources on the Internet, electronic libraries and so on. Also only few use forums, webinars and wiki.

In our opinion, the main reason for this is the low competence of the teachers in the field of e-learning technologies.

Project

To solve this problem, a new course 'Design and Development of E-learning Resources' to upgrade university teachers' competence in IT has been elaborated at Plekhanov University.

The first group, consisting of Plekhanov teachers was formed in the beginning of 2014: 11 people had been selected from the volunteers, who mainly represented the 'economic block', as economics is the core competence of the University. There was 1 person teaching sociology and 2 mathematicians. As for their age most of the participants were between 30 and 45 – it was almost impossible to persuade older people and the younger claimed that they 'knew better' without any particular training.

The course puts forward 2 main tasks:

1. to familiarise the listeners with the theoretical basis, systems and technologies of e-learning
2. to help them acquire the basic competences of an e-learning resource developer and elaborate ready to use software tools to support the learning process

Consequently, the course can be roughly divided into 2 parts – theoretical and practical.

The first part covers foreign and national experience in e-learning and highlights the main trends in its development. The effect of e-learning depends on the form and way of application of Web and Internet technologies for every particular case. That is why it is of vital importance to demonstrate to the participants the diversity of e-learning tools. Special attention is paid to:

- Authoring Packages;
- Learning Management Systems – LMS;
- Content Management Systems – CMS;
- Learning Content Management Systems – LCMS

To start the practical part Moodle (Modular Object-Oriented Dynamic Learning Environment), an online Learning Management system is used. Moodle is free, accessible and easy to use and allows its users to tailor the course to practical needs. It is compatible with other Internet resources and can integrate external applications and content. The design and development of Moodle is directed by a "social constructionist pedagogy" based on three concepts: constructivism, constructionism, social constructivism.

Constructivism, in general, means constructing new knowledge on the background of your prior knowledge and experience

Constructionism implies that learning can be more effective if a student transmits the acquired knowledge further on, e.g. explain something to his/her group mates.

Social constructivism 'extends constructivism into social settings', where individuals are sharing the common constructed culture.

So Moodle is offered as the main platform for creating interactive environment.

As webinars are particularly convenient for the interactive learning especially for courses with a lot of charts and graphs, the next practical step is devoted to the software tools used for webinars and online conferences. Different e-learning platforms are being investigated, ranging from 'box' services to SaaS-solutions. They include Webinar.ru, Comdi, iMind, Acrobat Connect Pro, Mirapolis Virtual Room, Virtual class, Webtutor, eLearning Server, iWebinar, Competetum ONLINE, Teachbase.ru). However, only the platforms supporting the Russian language have been deliberately chosen, in order to involve all students, not only those practising the English language.

At the final stage, the participants are supposed to design and develop certain parts of their courses. They are taught to compile and upload educational resources on LMS server, adjust monitoring environment and estimation of the students' progress. The project 'The design of the electronic educational resource for the learning process' is the climatic finish of the course.

All 11 teachers of the first group completed the training courses successfully. Their feedback expressed high degree of satisfaction with it and demonstrated their willingness to integrate interactive activities such as simulators, short videos in their classes and extend their teaching process beyond the classroom for example, in webinars and conferences. Though most of the participants still do not feel completely secure with IT, they overcome their resentment against the new methods of teaching. Now they clearly understand the possibilities of modern technologies, are able to formulate their needs and objectives to the programmers and work in close collaboration with them. They can customize the created courses to the needs of particular groups or individuals and choose to use multimedia tools to make the learning

process more attractive for students. Since then the training for the teachers is organized on the permanent basis.

Results

The most illustrative example of the successful team-working of teachers and programmers after the courses is the joint products – interactive workshops: 'Marketing' and 'Macroeconomics', focusing on developing of practical skills and acquiring of professional experience.

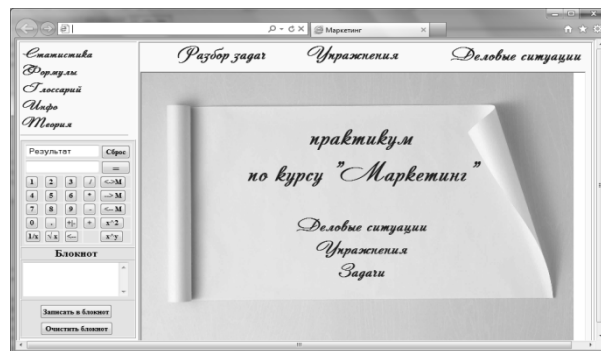


Figure 1. Homepage of 'Marketing' simulator

These simulators include online manuals, collections of problems and exercises, lecture notes; multimedia resources such as graphs and charts. Besides they provide main formulas with comments and a calculator with a memory buffer to keep interim results and notes.

All the problems to solve are divided into several types:

- *with solution*
Students can solve the problem either by themselves or if they face difficulties, see the process of solution.
- *with tips*
Students can get the answer (a figure).
- *task themselves*
The system only informs a student whether the solution was right or wrong. This is the intermediate assessment of students' progress. The marks are accumulated and used for controlling.
- *cases*
A student can choose a case and in a new window gets the contents and the tasks to fulfil. In the end of each case there is a reference to be clicked on in order to send the solution (Word format) as an enclosure to an e-mail.

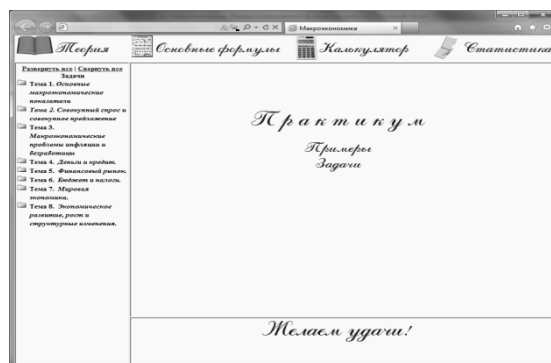


Figure 2. Homepage of 'Macroeconomics' simulator

The theory is provided through a tiptool. When a problem is being solved the necessary information from the manual pops up in the separate window if the button 'Theory' is clicked.

First of all such interactive simulators attract students with their novelty in comparison with the traditional ways of controlling and consequently increase the interest of students in their studies. Secondly they encourage a student to work systematically as control is inevitable. Thirdly, they motivate students as they make them compete.

So these simulators have been integrated in the respective courses at the faculty of marketing and according to the questionnaires, spread among the students, have been appreciated by them. Now they are presented and proposed to all teachers of marketing and macroeconomics in Plekhanov

MOOCs – Plekhanov

Another achievement of Plekhanov teachers is their joint work with the Universarium team. Universarium MOOCs is a Russian system of mass open online courses developed on an open platform using the experience and educational standards of Coursera, Udacity, eDX, etc. Its site claims that only the best teachers of the leading Universities of the country can provide their courses for the millions of people. At the present moment the language used is Russian but all the courses will be translated into English this year.

6 courses of Plekhanov professors have been included on the list. They range from microeconomics to history, e.g. 'Investments into Future', 'Entrepreneurship', 'Innovations for Business or Business for Innovations', 'Russia in the Period of Revolutionary Shock', etc.

Each course lasts 7-10 weeks-modules and includes video lectures, homework and tests. The work is organized in a pattern similar to the well-known international ones. A participant through his /her personal account can find out his/her interim results, get his/her rating and even give his/her comments on the lectures, the participants can also communicate with each other and even estimate each other's work. If a participant wants a Plekhanov university certificate, he/she can ask for an additional consultation and take a test on the premises of Plekhanov.

About 3000 people have already completed the courses and more than 5000 have registered for the new season. Parts of them are Plekhanov full-time students willing to enlarge their knowledge and enhance their skills. Now the standards are being elaborated about how to combine these courses with the full-time education, precisely how to avoid the overlaps or how to calculate the marks for courses tests and transfer them into the students' credits.

Conclusion

To cope with the changing reality and to fully satisfy the needs of their 'digital' students, teachers should integrate more e-learning tools in their teaching process. Digital environment is in high demand not only by distance learners but should become an inseparable part of face-to-face teaching. That means that teachers should also constantly learn and upgrade their skills and work in close collaboration with the programmers and other technical staff.

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USING SMARTPHONES IN ACTIVE LEARNING: ENTREPRENEURSHIP BEHAVIOR TAUGHT DIFFERENTLY

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Introduction

This poster presents the results of a 60-minute live undergraduate activity using smartphones used as a method to teach entrepreneurial behaviour skills. We will share the experiences of the implementation of a class dynamic aimed at Brazilian graduate students in Entrepreneurship. This may offer potentially valuable contributions to the development of other learning tools aimed at graduate students using active learning concepts and cell phones in class in an educative way. We will address the following conference themes: tools and resources for learning through mobile devices, innovative uses of smartphones and mixing formal and informal learning.

Background

Human capital theory says that those who have more knowledge, skills, and other competencies will achieve more and perform better. In a meta-analysis of entrepreneurship education outcomes, Martin et al. (2013) have found support, in the context of this theory, for the value of entrepreneurship education and training. Learning scenarios seek to be more connected to the student's outside environment. Moreover, this subject is of increasing concern for governments and is growing rapidly in universities and colleges throughout the world.

Entrepreneurial orientation can have a mediating role in the environment-performance relationship, important in governance patterns that generate opportunities for their organizations to attract resources. In Brazil, studies by Sebrae (Regional São Paulo Brazilian service of assistance to micro and small enterprises), an institution supporting the development of small and micro companies in Brazil, show that the absence of previous planning and inadequate business processes are one of the main bankruptcy causes among micro and small enterprises (2008). Fluminense Federal University has created the first Brazilian Entrepreneurship department. A graduation in management and entrepreneurship is offered to 100 students a year contributing to generate perceptions of the desirability and feasibility of starting a business and gives practical knowledge as how to conduct all main business operations.

Using Smartphones in Active Learning: Entrepreneurship Behavior Taught Differently

Isabella Chinelato Sacramento, Sandra Regina Holanda Mariano

Mobile phones reach virtually the entire Brazilian population. Almost 300 million mobile phone lines were already active in 2013 with 136.45 accesses per 100 inhabitants. Prepaid services amount to 78.05% of this total reaching 211.58 million phone lines. Mobile broadband had 103.11 million accesses, 1.31 million of them from 4G terminals. (ANATEL – Brazilian National Telecom Agency, 2014). Smartphones add a lot more teaching and connecting possibilities mainly due to the Internet. Although good quality broadband access is still not available throughout the country, some universities, including Fluminense Federal University provide free access to the students at a reasonable speed, allowing the activity to take place.

Multi-tasking with texting, e-mail, Facebook, MSN messaging and the like during class time is pointed as having a negative impact on learning (Jacobsen & Forste, 2011). Investigating over 500 college students from a large Midwestern US public university, Lepp et al. (2014) have found growing evidence that college students' cell phone use is negatively associated with academic performance as well as mental and physical health. These authors, though, point the modern cell phone as a tremendous technology to improve educational outcomes and suggest further research is conducted to identify more appropriate uses of this technology.

One of the challenges to teach behaviour competencies in management education is to make the students achieve a significant type of reflective consciousness that leads to learning new meaning. Cunliffe (2004) calls for stimulating this form of critically reflexive practice. The fast-paced activity presented in this poster intends to bridge these needs. The undergraduates have to use their cell phone in class in an educative way and it also catches them off-guard instigating an immediate reflection about the observed behaviours often without them having to be prompted by the instructor. The activity we present has already been used for two years yielding very good results, which are going to be related.

The Activity in Details

The activity using smartphones to teach entrepreneurial behaviour skills is presented in detail to allow a better comprehension on how it works. The dynamic was planned to contain the following actions:

Introduction (Opening comments)	5 minutes
Practical hands-on smartphone activity (detailed below)	20 minutes
Roundtable discussion (Connection to the theoretical background / applicability of the findings to the student's own subjects)	20 minutes
Roundtable reports and closing remarks	15 minutes
Total	1 hour

The 20-minute hands-on activity consists of three main parts:

Part One – *Confidence* – The instructor begins by asking a very simple task: any search the students should do over the Internet. It can be a funny translation or a fun fact about a character such as an important or distinguished CEO. This activity has to be simple and one that most participants can probably follow (in later discussions with the participants this

moment will be referred to as the “initial confidence” moment). Depending on the group, the difficulty level can be adapted to more challenging searches or a combination of tasks they have to accomplish, but the instructor should bear in mind that the main goal of this part is for the students to feel really confident about their own abilities. A small note is that in poorer neighbourhoods, pairing the participants may be necessary if some of the students do not have smartphones.

Part Two – *Surprise and Doubt* – The instructor asks for a much more challenging combination of advanced searches (a useful resource might be Google Advanced Search documents). The instructor can create and post online specific trials dosing the degree of surprise and doubt, but keeping in mind that the students have to feel challenged. It is to confront them with their own behaviour when challenged that we are seeking. It has to be clear for the students that all the searched content is available. It is preferable that the information and links they have to find are of value in their own perception (old tests for the discipline for example or fun facts which make them laugh). The reactions now are expected to be different, but are generally comprised of quite a specific set of possibilities:

- The shocked – this kind of participant thinks they would never be able to complete the challenge and tend to feel very uncomfortable towards the instructor.
- The expert kind – even if it seems hard for the others they will have no difficulty in coping. People in this group can either have a drive to help others or tend to brag about their own ability.
- The curious – this participant tends to be genuinely interested in the possibility of completing advanced searches so fast, they never thought they could do something like that and want to try it.
- The tenacious – They will be heavily concentrated and focused trying to cope with the activity but from that moment on they will barely listen or pay attention to the others.
- The laughing kind – This participant gives up trying really hard to learn and since there is in fact a ludic aspect to the exercise, they will try to cover up their inability or lack of will to learn with attempts to undermine the exercise.

A debrief will follow on Part Three. All these behaviours will be related to the difficulties a manager or entrepreneur encounters when his business context changes, principally when the new context seems to demand more of him than he was previously expecting.

Part Three – *The bridge* – In about 10 minutes, depending on the challenge given, it is usual that around at least 30% of the participants have completed the whole task, about half will leave with the feeling that if they were given five minutes more they would, and the other 20% will either not really try or be the ones with real difficulties with searching through the smartphone in general. In any case, the debrief will correlate all the immediate learning outcomes with the appropriate behavioural theory.

Findings

The search activity yields the educational results it was designed to provide.

Using Smartphones in Active Learning: Entrepreneurship Behavior Taught Differently

Isabella Chinelato Sacramento, Sandra Regina Holanda Mariano

As the debrief follows the activity, the students are confronted with the behaviour they have just shown. In the beginning the reflections are mainly on the difficulties they have encountered, but after a while they get to the point where they discuss how they have dealt with the challenge. They are encouraged to write about which behaviour they have shown and which way they would have liked to react. Attitudinal skills are largely valued in entrepreneurship partnerships and the connecting theory is presented when they have reached this point in the discussion.

The undergraduates are very excited to be asked to do an activity using their smartphones. In their reports they comment “most of the time the professors do not want us to use our phones during class, it was fun to do just the opposite” or even “this time, the pop-up messages from my friends really annoyed me... I was in a hurry to complete the search”. Even if they are graduate students, they are not as familiar as they think they are with searching tools. They marvel at particular searches using specific formats or “not filtered by license”. Many educational resources are not familiar to them. They have heard about free journals, translation possibilities, but many of them have not experienced going for it. Entrepreneurship is largely about being connected to the world’s main information.

The majority of the learners notice that difficulties in searching prevent them from using readily available open educational resources (OER) and programs. Having to do searches at the main available OER databases, establishing contact with enterprises and educational resources through their own smartphones open their minds to the enormous capabilities of being connected.

The active learning approach presented helps students to make contact with their own behaviour when faced with an unexpected challenge. Allowing for many different proposed behavioural learning outcomes, depending on the subject taught, this very fast dynamic can be done in virtually any classroom space and has a powerful appeal for the learners because of its ludic aspect. They experience the method practically using their own cell phones, are guided through the discussions to reflect about the theoretical background and about the applicability to their own realities.

Future dynamics and programs are suggested to take into account discontinuity issues, developing methods for evaluating learning effectiveness. Stimulation mechanisms could also be considered, such as rewarding good students or recognizing the most reflective reports.

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PERICLES OR HOW TO ASSESS AND TO IMPROVE QUALITY IN HIGHER EDUCATION

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Summary

The PIA project called PERICLES is a French project with two main objectives. The first one is to offer to Higher Education (HE) institutions a methodology and a digital tool to evaluate the quality of the formation they provide. The second objective is i) the development of a recommender system able to suggest open educational resources to learners and ii) to identify learning paths based on actual practices in order to compare them to those designed by the trainers. The paper is organized as follows: a first section aims at giving an overview of the project. A second section describes the methodology and the digital tool dedicated to the quality evaluation. A third section is devoted to the recommender system and the paper ends by drawing some perspectives.

Introduction

In a context where the development of higher education, including internationally, is intensifying and training throughout lifelong learning becomes essential to maintain and develop the skills level, it is crucial for higher education institutions to implement an approach volunteer to ensure the quality of training they provide.

The development of the number of OER (Open Educational Resources) as well as increasing the use of LMS is a good thing for learners but often they have difficulties to find the well adapted OERs to their needs in the huge mass of resources. Also it is important that they can be recommended in their learning path inside repository of resources with recommendations systems based on the peers learning paths and which progress dynamically.

The project

Partnership

The partnership is very diversified and it can be considered as a richness as It brings together universities, research laboratories, a “grande école”, digital thematic universities and big and small enterprises.

- HEC – CCIP (Public higher education institution) project coordinator
- AUNEGE (Digital Thematic University – Economy and management), portée par
- Université Paris Ouest Nanterre La Défense
- UOH (Digital Thematic University – Humanities), supported by Université de
- Strasbourg
- LORIA – Unité Mixte de Recherche du CNRS, de l’INRIA et de l’Université de
- Lorraine (research laboratory)
- SAILENDRA (SME)
- E-Charlemagne (SME)
- DEMOS France (large Company)
- ALTRAN (large Company)

Associated partners:

- UNIT (Digital thematic university – Engineering and Technology)
- UTOP – Open technology open university (IDEFI – excellence initiative for innovative trainings)
- Fédération Française de la Formation Professionnelle – FFFP (Professional organisation)
- Distance Learning inter university federation FIED
- ESUP Consortium national project on digital space of work

Project duration and funding

It lasts 36 months, ends April 2016.

Plan:

- 1st year:
 - v0 prototype development of e-Pericles Application
 - development of the core evaluation criteria
 - functional specifications of the application, interfaces and Observatory
 - development of prototype v0
- 2nd year:
 - Experimentation and prototype development v0
 - v1 prototype interfacing with competence standards interfacing with monitoring traces of the learner

- 3rd year:
 - Experimentation v1 prototype development of the final version v2

Funding: Investissements d'Avenir Développement de l'Economie Numérique.

E-Pericles Teaching evaluation tool

Principles

E-Pericles is an application, which allows a higher education institution or a vocational training organization to implement an internal quality assurance policy. During the design conception the main principle is to not impose a policy to the institutions but to be enough flexible to every kind of institutions

Main Functionalities

The tool offer to teachers, head of university departments to create/share questionnaires .The questionnaires can be easily build thank to a items data base of about 1000 items for each context. There are several contexts for them each item is adapted in terms of vocabulary and use (face to face, on line or hybrid teaching and academic, vocational or MOOC contexts).The tool has been also developed to be used by OER repository to evaluate the quality of their resources. The data base is composed of domains, criteria, sub criteria and items. The wording of each element (items, sub criteria...) is editable in the aim to be adapted by the user in his (her) own need. To each item can be associated a personalised answer modality (open question, Likert level, neutral answer others).

After creation of questionnaires the tool offers to launch evaluations it means to associate respondents, timing and other information to a questionnaire. Those associations can be done via connecting to the information system of the institution or by uploading excel files .The results are available in real time and at the end of the evaluation the tool offers the possibility to edit a report. A part of the project is to create an observatory which will aggregate part of the data and give information on the practices in the teaching evaluation field.

Progress and presentation

The evaluation tool will be in version 0.6 in June 2015 and available to a demonstration during the presentation at the conference .The last version of the evaluation tool will published as open source software.

Recommender system

In France, seven DTUs (Digital Thematic Universities) organize the open access to more than 24,000 OERs (Open Educational Resources as defined by UNESCO). A DTU can be viewed as a thematic repository of OERs, all produced and peer-reviewed by the academic community and indexed using SupLomFR (the French declination for higher education of the LOM standard). Facing the huge numbers of OERs and not familiar with the SupLOMfr indexing, most of users leave the DTU's portal without finding pertinent pedagogical materials. Thus it

seems of real added value to assist the user by a recommender system that suggests pertinent and adequate resources to him.

The task of the recommender system could be viewed as the task of a librarian who helps users to find a pertinent book within a library. In a library, books are classified by thematic. A user's request will be linked with the thematic which matches it the best. A recommender system works on the same way: it classifies the UOH dataset in clusters in order to give recommendations according to the thematic of interest of the user or the learning behaviour of the learner.

Many approaches can be envisaged, either based on the content or on the usage of the OERs. Indeed, in the context of e-learning, it is crucial to make accurate predictions: a recommender with a low quality of prediction is not acceptable. The quality of prediction can be highly affected by the sparsity of resources: a problem appears when the last resource viewed by a user is an isolated resource (no highly similar resource in terms of keywords and disciplines exists).

We design two recommender systems: the first one relying on the last resources the user has consulted: the recommender system takes into account the fact that a resource has been accessed as well as its description in SupLOMfr. The interest of using information such as disciplines and keywords is to recommend the most adequate resources. This approach has been tested on the portal of the DTU in Humanities (UOH) (ref Eden workshop 2014 and ECTEL 2014 short paper). The second takes additional information when information about a learner is available via for example the LMS of the university he is enrolled, it is possible to hybridize various techniques. We propose another recommender system based on word semantic similarity and page ranking. The algorithm was implemented and tested with the data collected from the Open University of Humanities (UOH). The result of this work was published in the EC-TEL 2014 conference.

Conclusion

Pericles project will reach its two main objectives. The next steps for the first objective will be to enlarge the use of the methodology and the digital tool to evaluate the quality of teaching to others Higher education institutions both in institutions using French language and to HE using different languages.

For the second objective (the two recommender systems) the next steps after testing algorithms in the project partner's environments are to test the robustness of them in many others contexts

THE MANAGER IS BLOGGING: BLOG MAKING AS A TEACHING/LEARNING METHOD

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Introduction

The development of new technological resources and the popularization of access to online content, for the most part free, such as textbooks, articles, blogs, videos, games and simulations, have modified the ways learning take place. These resources enable students to take an active approach to learning, in the performance of tasks related to pre-existing content, as well as in the creation of new materials.

In Brazil, the Administration course is designed around three subjects: basics, vocational training, and technologies. Basic training includes anthropology, politics, sociology, philosophy, psychology, ethics, human behaviour, economics, accounting, communication and information technologies, and legal sciences. The sociology course explores the aspects of culture, control, social stratification, rationality and power, and the studies of the classical sociologists (Marx, Weber, Durkheim) all in the context of organization and work processes.

Since it includes a plethora of theoretical content, the students find it difficult to assimilate the subject with the actual practice of Administration, making it necessary to seek new tools to assist in the relationship between the theory and its application. The purpose of this article is to present the experience of designing blogs, carried out by four groups of students in Sociology Applied to Administration from the Federal University of Rio Grande do Sul.

Technology as a way to Active Learning

Although new technologies have always been used in management education, it has increased recently, both through the emergence of new technologies and experimentation and use of them in the classroom. Faster processors, faster download, better image quality and cheaper computers and screens have helped make it possible to use video and audio in real time. As a result, websites such as iTunes U, YouTube, and Academic Earth are becoming global repositories for sharing teaching materials.

Advances in technology permit two major changes in management education. First, technology reduces passive learning, where the student only partakes of the content presented by the professor. Second, it allows for the building of active learning, both face-to-face and

virtual, enabling students to broaden their participation as actors in the process (Rollag & Billsberry, 2012).

Many professors have used different resources to delve deeper into the content, by creating new teaching techniques: Schultz and Quin (2014) presented a learning proposal through video production by students, underscoring how this practice contributed to the learning of problem-solving techniques, provided direct experiences in the production of material and fostered group interaction and collaboration. Watson and Sutton (2012) analyzed the case method study when applied online, comparing synchronous and asynchronous communication. Krom (2012) studied the use of FarmVille to stimulate active learning in a managerial accounting course.

Thus, as can be seen, different technological resources may be used to encourage learning in management, where presentation of these experiences is relevant for greater popularization of these practices.

From idea to practice

The primary objective of making a blog, which entails a website in which it is possible to post quickly and that may contain text, photos, videos and animations, is to reinforce the content studied during the course and make students reflect on it. In addition, the choice to produce a blog as one of the course assignments was for the purpose of building a closer link between classical content and the virtual world that is part of most young people's lives. The assignment was carried out in groups of four or five students and was comprised of four main stages: (i) creation of the blog and giving it a name; (ii) weekly posts related to the course content; (iii) preparation of a 5-10 minute video on one of the themes studied; and (iv) presentation of the blog and its evaluation by co-students.

First stage: during the fourth week of classes, once students had already studied about the emergence of Sociology and its relationship with Administration, as well as explored the classic authors of Sociology, such as Karl Marx, Max Weber and Emile Durkheim, they were asked to create a blog. This time frame was chosen so that students would already be familiar with the content and able to link the name of the blog and its visual identity with the course.

Second stage: weekly, at the end of each class, students were asked to do a post with stories, videos found on the Internet or texts related to the theme of the week. Each post was presented as a challenge, to stimulate further reflection and interest on the part of students to perform the assignment. The table below shows some of the requested tasks and their relation to the content.

Table 16: Challenges

Content	Task Requested	Objective
1. Classical authors of sociology (Marx, Weber and Durkheim)	Locate and analyze an already existing blog on the authors	Obtain deeper knowledge about the authors
2. Social stratification	Locate and comment on news articles addressing stratification in Brazil	Recognize how the content studied is presented in the country's media
3. Culture and organizational culture	Do a case report (on someone from the group, taken from a blog or news article) about cultural shock	Reflect on the relationship between different cultures in the globalization process
4. History of what was studied	Look for videos that address concepts of what was studied in class	Show examples of theoretical content studied
5. New management models: (Taylorism, Volvism, Industrial districts)	Prepare an overview in table format of the social, economic and political situation of the United States, Brazil and Japan in the 1970s and 1980s	Show clearly that the management models are related to the context of each country

Third stage: In the last three weeks of the course, students were asked to create a video, a mini documentary delving into some of the themes studied during the course. The students had approximately three months to plan and prepare the video. No specific technology was required for filming, which ranged from the use of cell phone cameras, normal cameras and even camcorders. The technical aspects of the filming itself were not assessed, but rather the creativity employed by the groups and their understanding of the content studied.

Table 2: Blog examples

Name	Blog address
SocioOcio	http://sociocio.blogspot.com.br
Augustecontememais	https://www.tumblr.com/blog/augustecomtememais
Sociosfera	http://sociosferaufrgs.blogspot.com.br
Administrados	http://administrados14.blogspot.com.br
Talkgirlytome	http://talkgirlytome.tumblr.com

Fourth stage: Each group presented their blog to the class, commenting on some weekly posts, focusing on what they learned, and then showed the video. Each group assigned the others a score for the presentation and another for the video, providing them with opportunities to also evaluate what their colleagues had learned and the effort put into the production. Lastly, in an effort to engage the class not only in the preparation of the blogs, but also in the process for building and improving the activity, each student received a sheet with topics to evaluate the course and, specifically, the blog-building activity as a way to facilitate learning.

Lessons from the experience

The creation and development of blogs by students yielded a number of benefits in the learning process. The main ones include:

- greater student interaction through weekly group activities;
- stimulating creativity in the creation of the blog and posting challenges;
- monitor weekly how the content studied was being understood by the students, making it possible to correct any misunderstanding of concepts and to delve deeper into topics of greatest interest;
- expand study time beyond the realm of the classroom;
- involvement of students in the assessment process;
- development of new skills such as designing a blog and creating videos.

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GAMIFICATION OF A SOCIAL LEARNING NETWORK IN A VIRTUAL UNIVERSITY: IMPLEMENTATION PROPOSAL AN ACADEMIC NETWORK

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Introduction

In Distance Learning, Information Technologies (IT) have been used for decades as mediators of the student-teacher interaction (Bates, 2011), which was low in the first generations (Morgado, 2001; Gomes, 2003; Valadares, 2011). Today this interaction is online and pervasive, though for the most part asynchronous and textual, nonetheless ideal for promoting a high-order cognitive learning (Garrison, Anderson & Archer, 1999, p.90). This type of Distance Learning is generally called e-Learning, though this designation is open for debate (Sangrà et al. 2011).

The Learning Management Systems (LMS) are common IT applications, which enhance the student-teacher and the student-teacher-content interaction. They make possible for the grouping in the same virtual space ("virtual campus") of diverse pedagogical tools and managerial services (Dougiamas & Taylor, 2003). "Moodle" is one of the most used open-source LMS and is considered an efficient tool for learning, from a Socio-constructivist perspective (Coll, 2004). This type of LMS can be seen as oriented by a Web 1.0 paradigm (O'Reilly, 2007): a repository of content promoting educational activities, mainly asynchronous and text-based.

Garrison, Anderson and Archer (1999) proposed the Community of Inquiry framework (COI) as a tool to understand the Computer Mediated Communication (CMC) and for the promotion of significative learning in higher education. This type of learning happens inside a Community of Inquiry through the interaction of three presences: Social Presence, Cognitive Presence and Teaching Presence.

Social Presence is related to a feeling of belonging between students, teachers and contents in a shared social space of learning. This happens by the projection of the individual characteristics of the learning in the community. Even in a text-based environment this projection may occur by the use of *emoticons* or other symbolic representations (Garrison, Anderson & Archer, 1999; Walther, 1996).

The *Cognitive Presence* is related to the ability of the students to reach a critical reflection about the contents (Garrison, Anderson & Archer, 1999). The *Teaching Presence* is reflected in the way teachers guide and help the students, directly or indirectly (focus discussions, defining topics...) (Garrison, Anderson & Archer, 1999). As said by Layne and Ice (2014): inside a learning community, the group cohesion and open communication created by a *Social Presence*, and the structure and organization nourished by the *Teaching Presence*, make possible for the creation of a Community of Inquiry where the *Cognitive Presence* may flourish.

The COI framework has been validated for 10 years and the construct Presences proved efficient, though there is space to validate the composition of the three presences across various courses and populations (Garrison, Anderson & Archer, 2010). The COI framework has at its core a collaborative constructivist view (Akyol et al., 2009) which is appropriate for eLearning in a web 1.0 paradigm.

The Web 2.0 or Read/Write paradigm on the other hand is dominated by a new set of principles and practices, mainly leveraged by Social Software, allowing its users the co-creation of all kind of digital artefacts and the collaborative learning, formal and informal (Franklin & Van Harmelen, 2007; O'Reilly, 2007). For this new reality, "Net-centric" learning theories must be taken into account: it is the case of Connectivism, Heutagogy and the Pedagogy of Nearness (Siemens, 2005; Anderson, 2010).

Connectivism states that learning happens in dynamic and ever changing environments with low personal control (Siemens, 2005). Learning is distributed across a Network of points of access and nodes of information. Learning and knowledge may reside in non-human appliances. Learning happens in the process of establishing (focused) connections between, and across networks. There is no consensus on Connectivism. Downes (2010) for instance, was critical of Connectivism as a network learning theory, saying that learning happens in a specific context and with facilitating conditions.

Heutagogy postulates the need of "learning how to learn". Education must be focused on promoting new learning and digital competencies, to help coping with an ever changing information society (Anderson, 2010, p.33).

The Pedagogy of Nearness says that learning in the Web is not keeping people apart. On the contrary is enhancing relationships and blurring the physical and online barriers (Anderson, 2010, pp.32-33). Mobile and location-sharing services are a good example of this. Another important concept is that of Social Learning (Reed et al., 2006). This type of learning happens when there is a change of knowledge besides the individual and his interactions, inside a Social Unit, Network, or Community of Practice. In this environment Learning is cooperative, situated and shared by the community and its members, which is involved in the creation and conservation of knowledge (Rendell et al., 2012).

Students today, use Social Media mostly for socialising and learning in informal spaces (Lin & Lu, 2011) but are open to use Social Media and Social Networks, for learning activities in higher education (Roblyer et al., 2010). So, Social Media can be used to promote the interaction between students and motivate discussion about learning materials, but should not be used for controlling their interactions (Siemens & Weller, 2011).

Recently Dron and Anderson (2014) identified a typology of social forms for learning: Groups, Sets and Networks. The identification of each form is useful to identify the focus of analysis of the educational interventions, in this web 2.0 paradigm. eLearning dropout rates are higher for online students than for face-to-face classroom settings. This is due to dissatisfaction with the eLearning process, the lack of feedback of online activities, the failing of created expectations with e-earning and the lack of motivation or support (Levy, 2007; Njenga & Fourie, 2010).

Gamification is a recent trend that is being used to promote the engagement, motivation and participation in various types of activities, including Education (Cheng & Vassileva 2005; Tomkin & Charlevoix, 2014) Gamification is already being used in several universities in the United States and the United Kingdom, from small courses to postgraduate studies (APM, 2014). Gamification is the application of Elements derived from Games in a non-Game context, to promote the engagement and motivation of the users and enhance its experience (Deterding et al., 2011a). Almost any activity can be *Gamified* to improve the collaboration, cooperation, and motivation of its users. This Elements can be isolated and used in many different configurations (Deterding et al., 2011b).

The Gamification Elements, or independent components of Games that can be used for Gamification are:

- Scoreboards;
- Leaderboards;
- Ratings/Rating Systems;
- Badges, Medals and Rewards, Virtual goods and currencies, and other Incentives;
- Status indicators;
- Levels, Achievements and Goals, Maps, Points;
- Feedback system and mechanisms;
- Rules and Rules Systems.

Vassileva (2012) listed three types of incentives that can be used to raise the participation of users of a Social Computing Application: Extrinsic, Intrinsic and Social. There are some theories that can support the use of Gamification, to foster engagement and motivation, and help understand the way the game mechanics and incentives may work:

- Fogg's Behaviour Model (FBM): The users' behaviour (concerning IT) is determined by their motivation and ability in conjunction with a triggering event. This behaviour is lost or low if one of this components is missing (Fogg, 2009).

- Self Determination Theory (SDT): The motivation for executing some tasks can vary from no-motivation, extrinsic motivation and intrinsic motivation (Ryan & Deci, 2000). The extrinsic motivation depends on external factors like Rewards or Punishments. The intrinsic motivation on the other hand, is self-motivated, and evolves engagement and fun in the activity. The extrinsic motivation can evolve to intrinsic, by a process of self-regulation, concerning the repetition of the activity and a positive feeling by doing it. For this to happen, the individual must experience feelings of belonging, competence and autonomy. A sub-theory of SDT, the Cognitive Evaluation Theory, says that the social environment can also enhance or diminish the intrinsic motivation (Ryan & Deci, 2000).
- Flow Theory: The feedback people experience by doing one activity should be ideal. The activity must not be neither too difficult nor too easy, so the user is engaged, focused and absorbed, in a “state of flow” (Nakamura & Csikszentmihalyi, 2002).
- Unified Theory of Acceptance and Use of Technology (UTAUT): The intention to use a technology is dependent of three factors: expectancy of effort, expectancy of performance, and social influence. The use itself, is conditioned by two factors: The intention and the facilitating conditions. As moderators of use, we have: voluntariness, experience, gender and age. (Venkatesh, Morris, Davis & Davis, 2003). In a recent review of UTAUT, Venkatesh, Thong and Xu (2012) said that the perceived fun is also an indicator of acceptance and use of a technology.
- Collective Effort Model (CEM): The individual effort of a member inside a community rises when this effort is seen as important to the community, and is easily identified by the other members (Karau & Williams, 2001).
- Goal Setting Theory (GST): If, in the beginning of some activity, there is clear information about the difficulties and objectives of doing it, one can make some predictions on the motivation and contributions of the users (Locke & Latham, 2002).

Our context and proposal: Gamification of the SOL Network

Recently, the Athabasca University (Canada’s Open University) launched *The Landing* (landing.athabascau.ca) a Social Network for learning, to keep up with the changes of the Web 2.0 paradigm, improving social interaction, and foster social learning. *The Landing* is build on Elgg, one open source social networking engine and is being used to “offer facilities for building and sustaining networks of connections” (Dron & Anderson 2014, p.144).

Elgg was also used by Garrett, Thoms, Soffer and Ryan (2007) to explore new possibilities to raise participation and interactivity of students in higher education. They argued Elgg puts the individual at the centre of the learning process, with self-control over all the possible interactions (sharing content, privacy settings, file management, personalization and access. Even more, the authors said the Elgg environment was useful in promoting the *Social Presence* of the students.

Also using Elgg, the Universidade Aberta (Portuguese Open University), launched the SOL Network. “SOL” stands for *Socializing Online Learning*. This Network is shared by all the academic community and follows the guidelines suggested by the Pedagogical Virtual Model® of Universidade Aberta: promoting the social interaction between students and between students and the university (Pereira et al., 2007).

A Community of Inquiry is capable of promoting and supporting the significative learning of its members. The afforded interaction between them is very important for all Presences but even more salient for *Social Presence* (Anderson, 2005). This *Social Presence* is also encouraged by Social Software (Anderson, 2005), tools that support and motivate individuals to learn together, while maintaining individual control over their own time, identity and connections. So, technology can be made to sustain or create new learning environments, corresponding to the expectations of new learners in a Web 2.0 paradigm. The Elgg engine is such a technology, that can serve the needs of the identified Social Forms for education. (Dron & Anderson, 2014).

Also, technology can also be used to create a more fun and engaging environment in educational settings (Njenga & Fourie, 2010). Gamification can help achieving this. (Deterding, 2011a, 2011b; Munteam, 2011; Deterding, 2012). Gamification can also harness the feeling of belonging to a community or project (APM, 2014) improve participation and collaboration (Aguilera & Mendiz, 2013; Farzan, DiMicco, Brownholtz & Street, 2009) and is able to stimulate the metacognition of its members, making them aware of *what* and *how* they learn (Tang & Kay, 2014).

Our scope of research is a doctoral project, proposing the implementation of Gamification in the SOL Network. This is to verify the influence of Gamification on the social interactions and Social Learning, and on the Community(s) of Inquiry, inside this Network. Our Research Questions:

- Q1: What is the influence of the implementation of Gamification in an Academic Social Network?
 - Which Gamification Elements positively influence the collaboration/cooperation between members?
 - Which Gamification Elements negatively influence the collaboration/cooperation between members?
 - Which Gamification Elements can promote Social Learning?
 - Which Gamification Elements may hinder Social Learning?
- Q2: What is the influence of the implementation of Gamification, on the Presences of a Community of Inquiry, in an Academic Social Network?

Methods

Our Research Design employs a Mixed-Methods approach with a Pragmatic world view (Creswell, 2003; Feilzer, 2010). This view is concerned with the production of knowledge that is useful and oriented for problem solving in real contexts (Creswell, 2003, p.6).

We are using a Design Based Research (DBR) methodology, often used in educational research. DBR is focused on the systematic study of the instructional design, its implementation, development and assessment (DBR Collective, 2003; Plomp, 2007).

We want to understand the impact of the implementation of Gamification on the dynamics of the SOL Network, guided by our motivational theories. Our techniques for gathering data include Semi-structured Interviews, Focal Groups, Observation, Usability Tests and a Survey. For the analysis we are going to use Content Analysis, ARBC and Descriptive Statistics.

Field Work

We will divide our research into three different phases:

Phase 1

In progress:

- We made a literature review, with respect to our context (the SOL Network), and our research topics and questions.
- We are conducting Semi-structured Interviews ($n \geq 6$) with the aim of identifying patterns of acceptance and use of the SOL Network, by its current users.
- Incoming work:
 - The analysis of the Interviews will inform the construction of a *Gamified* prototype of SOL.
 - Usability Tests will be conducted with some users ($n \geq 6$); opinions will be collected using a Focus Group.

Phase 2

- With the results of the Focus Group the Gamification Elements will be incorporated in the SOL.
- Data will be gathered using Observation (posts, and comments), Social Analysis and the Analytics of the elgg platform.
- In the end of the second phase a Survey will be deployed.

Phase 3

- All the data will be integrated and analysed.
- All adjustments needed will be made to the platform.
- A new Survey will be deployed after this adjustments.
- All data will be integrated, triangulated, analysed, presented and discussed.

Discussion

We are conducting a doctoral research project, concerning the implementation of Gamification in an Academic Social Network. The aim is to verify the way Gamification (and the Gamification Elements) can influence social interaction and Social Learning inside this Network. We are using a Mixed-Methods approach and a DBR methodology. So far, we made a literature review following our topics, and conduct some semistructured interviews.

Some preliminary results indicate salient design characteristics of the SOL Network that should be considered to the implementation: students feel there is little interaction between themselves, and feel that there is some lack of control over the SOL functionalities.

Hopefully, after the implementation of Gamification our research will inform the theory and will give guidelines to the instructional design of a *Gamified* educational environment.

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STUDENT OWNED E-PORTFOLIO P3 (PORTFOLIO – PROCESS – PRODUCT) EMPOWERING STUDENTS FOR PROFESSIONAL AND PERSONAL DEVELOPMENT USING SYSTEMATIC REFLECTION AS A PEDAGOGICAL METHOD, IN THE HEALTH GUIDANCE PROGRAM, LULEÅ UNIVERSITY OF TECHNOLOGY

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The demands from society increase and students need to be able to adjust and continue learning after they have finished their studies. This means that they need to be made aware of their learning strategies and their competencies. The aim of this project were to create a student owned e-portfolio that could develop and enhance their reflection skills to build self-awareness to highlight their skill- and generic competence progression and to give them a tool that connected to their lifelong learning process. An additional goal was to make the e-portfolio free, outside of the university domain, and available on almost any computer or mobile phone operative system.

What we have done

LTU defined in 2012 a basic pedagogical idea, to enhance the student's learning and to support educational constructive alignment.¹ From that idea we developed an educational system linked to our initial idea of an e-portfolio. In September 2014 we introduced an e-portfolio made in the cloud service "Box" to approximately 30 students in their first year of the Bachelor Programme in Health Guidance, Major Health Promotion at Luleå University of Technology (LTU). The e-portfolio consisted of seven main folders:

1. Archive – Health Guidance Program,
2. Reflection portfolio,
3. Competency portfolio,
4. Career Center,
5. Contact portfolio,
6. Share folder,
7. Archive – Lifelong learning (see Figure 1).

During the introduction we emphasised that the e-portfolio is student owned, and that we only gain access to their share folder (6) when invited by the student.

¹ <http://www.ltu.se/ltu/lib/Utbilda/Universitetspedagogik/Pedagogisk-ide?l=en>

Student Owned E-Portfolio P3 (Portfolio – Process – Product) Empowering Students for Professional and Personal Development Using Systematic Reflection as a Pedagogical Method, in the Health Guidance Program, Luleå University of Technology

Martin Karlsson, Lotta Berglund

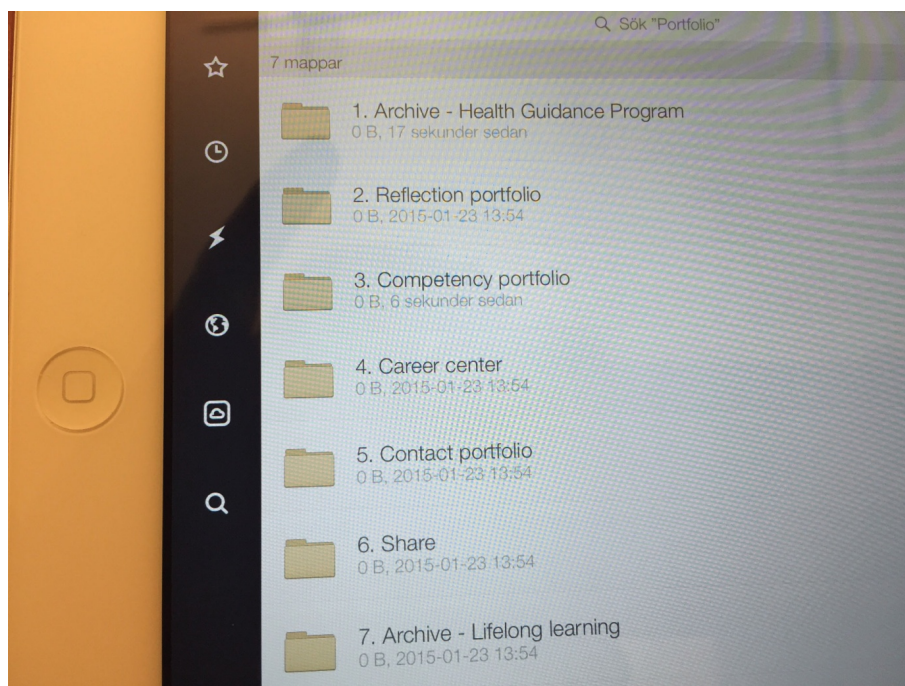


Figure 1. The e-portfolio on an iPad

The e-portfolio focused on systematic reflection throughout the program. It includes two levels: course- and program level. On the course level, reflection is integrated in the teaching by teachers in the course. The program level reflections consist of two reflections carried out during the last week of every semester (see Figure 2). The first reflection is about their generic skill progression during the semester and the second one is about the progression toward the graduation goals for the program. The students are also asked to file material in their archive (1) for later use in the program.

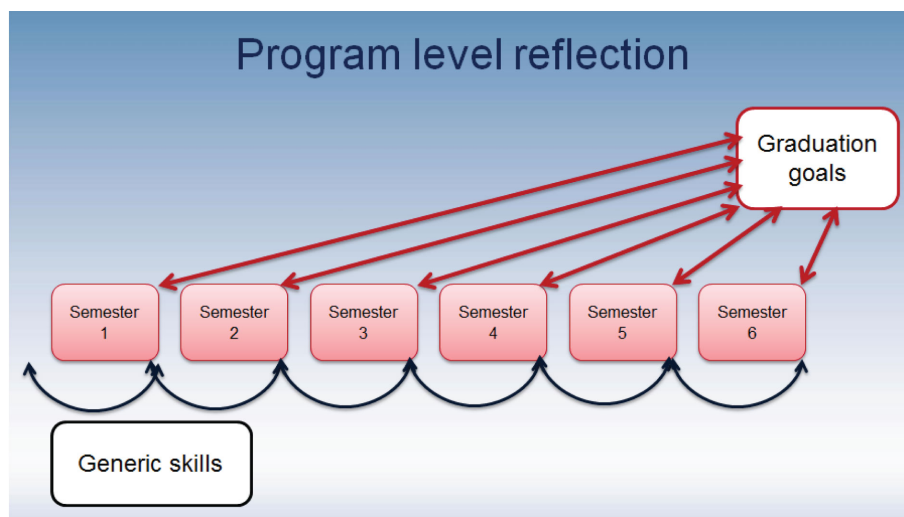


Figure 2. The two types of program level reflections

Results and implications for the students

The project, at the time of writing this abstract, has progressed half way into the first year. After some initial technical barriers, the students have become comfortable and fluent in using the portfolio. During this first period we focused on the reflection portfolio (2) and the archive (1). Students report that they now appreciate the reflection portfolio and using reflection as a method for learning and personal development. The reflection towards the graduation goals is designed to give us data to future studies.

In the future

During the second year we will continue to work with the archive (1) and the reflection portfolio (2) both on course- and program levels. But we will reduce our control of them, and shift our resources and work more with the competency portfolio (3). We will invite students to find products from their work stored in their archive (1) or their reflection portfolio (2) to showcase competencies and different generic skills, like problem solving, written/spoken communication, creativity, etc. in their competency portfolio (3).

Future development work on the e-portfolio will focus on the competency portfolio (3) and to find ways to integrate the reflection portfolio (2) even more closely in the courses. We will also seek funding to elevate this project into research studies.

About the Health Guidance program

The Health Guidance program is a distance based learning program with online learning complemented with on-campus study weeks at Luleå campus approximately 2-4 times every semester. The program is based on health promotion, where health is viewed holistically and seen from five dimensions: physical, mental, emotional, social, and existential well-being. Professional Health Guides work from a salutogenic perspective to maintain and strengthen health from an individual, group, and/or societal perspective. It is a pioneering profession with work opportunities in the health care sector, large organizations, as well as small businesses.

LEARNING TO LEARN COMPETENCY DEVELOPMENT WITH INFORMATION AND COMMUNICATIONS TECHNOLOGY USE: MULTIPLE CASE STUDY AT SECONDARY SCHOOLS

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Abstract

The PhD project research wants to be an approach to the learning to learn (L2L) competency by focusing on how to deploy this competency with an intensive use of information and communications technology (ICT); identify what practices of L2L are being developed with the ICT support and define improvement proposals and specific guidelines that help the development of L2L with the ICT use. We propose a multiple case study, carried out in four secondary schools of Catalonia which are contexts with a holistic and intensive use of ICT.

Introduction

The research project was designed based on current interest and need to move towards the personalized learning. Regarding that, we have been identified two main areas to promote its implementation: the L2L competency and ICT uses in learning.

We want to analyse the processes that enable the development of L2L competency, both from a strategic and methodological perspectives. The research also aims to identify what practices are being developed with the support of ICT, and show from students and teachers perceptions, specific practices which promote the L2L competency. To achieve that we propose a multiple case study carried out in contexts with a holistic and intensive use of ICT selected in Catalonia secondary schools.

The research results will provide an analysis of the challenges, problems and lessons learned from the L2L competency development and the role played by ICT in relation to that and the practices that are being arisen. It will also specify improvement proposals, recommendations and guidelines that facilitate this development considering the ICT use.

Justification

The research is based on social, economic and pedagogical reasons for the introduction of L2L competency at schools as well as the ICT transformer potential in educational practices. Moreover, the need for research from the practical point of view in this field is observed.

Today personalized learning is a tendency as a pedagogical practice. L2L is considered key to move towards the personalized learning and is the guide of all other basic skills. Is the competency core between the basics?

L2L is also a key competence that make sense to develop for the future society and to adjust the social differences, therefore is promote for World Development Organizations and Governments.

On the other hand, ICT uses and tools have a transformer potential to develop new environments with new learning practices.

Different sources claim investigation on L2L practices considering this aspects: the need for research on L2L competency and others skills to improve its development; the challenge to develop a shared thought of L2L in practice; the need to develop holistic ways to easy understand and promote L2L; the promotion of L2L as transversal skill otherwise its application will be diluted.

Research objectives and questions

Based on real and important needs at least in close contexts, we propose this research to describe how is being carried out the development of L2L competency with the ICT use and Identify L2L practices that has being developed with ICT support. Additionally, we intend to contribute to define improvement proposals and specific guidelines that facilitate the development of cross-L2L with the ICT use at schools.

Considering the objectives, the specific questions that arise are:

1. How is being developed the L2L competency at a strategic, methodological and curricular integration levels?
2. How are the ICT tools involved in it?
3. To what extents are consistent the deployment strategies of L2L competency with defined models of L2L?
4. What practices to L2L are made explicit to the students?
5. What practices to L2L perform the students?
6. According to the perception of students and teachers, what practices arise, are supported and enhanced with the ICT use and can be cross implemented?

Theory framework in research

The theory framework of this research is focused in two big reference areas: the learning to learn competency and ICT uses in learning.

L2L is not strictly a scientific concept. It is a complex term that includes affective, cognitive and dispositional factors. Furthermore, it has a disparate meaning, depending on how often is

being conceptualized the concept of learning. As a wide term, it could be considered an objective, a process and a methodology, a tool, an area of research and a result.

L2L includes aspects to be developed in different phases of the learning process: objectives, planning, development, assessment and reflection.

Smith et al. (1990), Watkins et al. (2000), Deakin et al. (2014) collect the main contributions to define and concrete the concept of L2L. Arinen et al. (2002), Deakin et al. (2014), Deakin et al. (2004) and Fredriksson and Hoskins (2007) present different L2L models that consider different perspectives.

As maximum common multiple of L2L scope involves the development of the following concepts: L2L awareness, orientation to learning objectives, know yourself, learning strategies knowledge, selforganization, selfregulation, selfreflection, selfassessment, collaboration, social and emotional aspects.

There are some publications studying the development of the L2L competency in different contexts and disciplines (Fredriksson & Hoskins, 2007; Martin & Moreno, 2007; Carretero & Fuentes, 2010).

L2L have been evolved from study skills, learning to think, learning strategies to metacognition.

We are interested in to study L2L as a process and a methodology in a holistic, cross and strategic vision.

Considering the different ICT uses in learning classifications we can highlights the Computer Practice Framework (Twining, 2002) focusing on supporting learning as a tool for acquiring and developing learning procedures and strategies. Allsopp et al. (2007) propose also a framework with features related to learning levels of technology integration.

In addition, ICT uses could be related with educational models (Kozma, 2011), learning activities (Conole & Fill, 2005; Conole, 2007; Ainsworth et al., 2012), learning support (Lai, 2008; Graesser & King, 2008), learning innovation (Bocconi et al., 2012) and competencies (Monereo et al., 2005)

Methodological approach

The methodological approach is on the interpretative paradigm. We believe that it is the paradigm that best fits because the main objective is to describe a complex phenomenon that it has different interpretations from a concrete reality, “the development of L2L” in its context, their characteristics and as its are being conceived from people involved, to understand and deepen on “the role played by ICT”.

At the same time we also want to be oriented towards the socio-critical paradigm, in the sense of contributing to the improvement by analyzing the phenomenon of the “development of

L2L” from the methodological perspective, and giving implementation proposals that could improve and make progress in this development to get the most benefit.

As strategic approach of qualitative research, we propose to use the case study method, because is a type of empirical research that investigates contemporary phenomena in the context of real life, especially when the boundaries between phenomenon and context cannot be detached so obvious and there are many variables of interest to many data sources to triangulate (Yin, 2009). We want to make a descriptive case study discovery oriented. It is a multiple case study in four secondary schools in Catalonia. The cases may be similar or not, but do not know a priori if they have any common feature. The interest cases are both for they singularity and for what they have in common (Stake, 1999).

In line with the research objectives, schools criteria selection will include a holistic ICT use reflected in its educational project as well as being defined and are unfolding L2L, either implicitly or explicitly, and so is also reflected in its educational project. (We understand as a holistic ICT use a strategic cross-intensive ICT use beyond specific uses in certain disciplines and certain teachers).

The techniques must be adapted to the analysis object and research objectives. To use more than one technique allows triangulation to ensure the research reliability (Stake, 1994). The techniques and instruments selected for data collection in this research are:

- To describe how is being carried out the development of L2L competency: school documentation collecting like the School Education Project, the curricular project, the ICT Plan, the disciplinary and departments plannings, the ISO documentation, specific plans and programs and other available interesting documents; and semi-structured interviews to school management and pedagogical and studies members committees.
- To identify L2L practices that has being developed with ICT support: open questionnaires to students and teachers; focus groups with teachers discussing about questionnaires results; and students weblogs reflecting on L2L.

The design of the different data collection techniques have a sequential approach, that is the design of each activity take into the account the result of the previous activity.

Where is the project currently up to?

Nowadays the project is currently in its early stage on the first year research. We are finishing the case study selection and initiation the data collection for the first case study, that will be considered as a pilot of the different techniques design.

Research contributions

The contributions of the research will be related to give an empirical analysis of the development of L2L competency in a school context with an intensive ICT use. Another added value will be to raise awareness and disseminate the ICT uses and benefits, in a cross and transversal overview beyond a specific discipline.

The research will be more focused on learning rather than teaching, gathering teacher perceptions but also emphasizing students' perceptions.

The first research phase will have as a result a report with the cases study analysis of the development of the L2L at strategic, methodological and curricular integration levels, with the ICT use, and compared with L2L models. The second research phase will provide a report with the L2L practices developed with ICT support at schools.

A final report will be produced with the guidelines and indicators to engage the development of L2L competency with the ICT use and support.

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RAPID DEVELOPMENT OF AN ELECTRONIC LOGBOOK TO SATISFY STUDENT PRACTICUM ON PLACEMENT IN AUDIOLOGY

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Abstract

The use of technology by academics in teaching learning and assessing in higher education has become increasingly important in the early part of the 21st century. In this paper the author traces the literature in the area of electronic logbooks (ELBs) also referred to as ePortfolios and presents a case study on how a turnkey solution to deploying an electronic logbook was achieved in a short timeframe for audiology students at Athlone Institute of Technology

Introduction

“When planning for a year, plant corn. When planning for a decade, plant trees. When planning for life, train and educate people” [1]

The BSc (Hons) in Audiology in Athlone Institute of Technology (AIT) is based on practitioners quality practicum developed by eight British Universities in line with professional standards upheld by the British Audiology Association (BAA) [6]. AIT had acquired rights to use the paper version of the logbook. In order to maintain the BAA standards AIT had committed to developing an electronic log book (ELB) [3]. The development of ePortfolios in medical education to facilitate learning and capture assessment [4] has happened in line with the move to blended learning in Higher Education in recent times. Development of the BSc in Audiology in AIT followed a long period of a dearth of undergraduate education for audiologists on the island of Ireland. AIT had carried out an amount of work on the development of the BSc in Audiology prior to the publication of the Health Service Executive (HSE) National Audiology Review [5] in 2011. Audiology training involves the acquisition of practical competencies and knowledge in the functioning of the auditory system in human beings. Audiology students develop these competencies in college first and then progressively improve them on their placement practicum. In this scenario audiology student undertake a yearlong placement. For the undergraduate audiologist this involves mastering skills in up to 35 different competencies. The audiology student has three levels in which to perform a competency. These levels are observation, participation and fully demonstrated [6]. The size of each student's record of up to 6,000 data fields, obviated the need for something other than a paper based logbook given the amount of detailed data

involved. Practice tutors and practice educators support assist and monitor audiology students' progress while mastering these competencies in clinical placement.

Literature Review

Portfolios are an essential tool for demonstrating professional accomplishments and documenting personal growth in a variety of professions particularly in healthcare in professions such in medicine and nursing [2]. In the new era of patient centred healthcare [21], [22], [23] with the emphasis on patient safety the question of professional competency is to the fore. Traditional paper based [2], [9], [14], [15], [16], [19], [20] logbooks of competencies are fraught with risk of error even from simple issues such as a clinicians handwriting or a logbook being misplaced. In addition the question of visibility of progress through placement practicum from stakeholders such as placement module leaders, practice tutors and students is limited where the practicum logbook is paper based. Paper based logbooks are also inadequate from the perspective of integrating data for analysis [2], [9]. The emergence of ePortfolios / electronic logbooks (ELBs) is seen as an important advance in management of competency based medical education [7]. Tochel et al. [18] describe ePortfolios as a collection of student work, which provides evidence of student learning, while giving clear guidance on assessment. They conclude from their study that ELBs when implemented correctly encourage increased personal responsibility for learning and have benefits for reflection and continuous professional development.

Paper based versions of logbooks have existed in professions like nursing and medicine for quite some time. Paper based logbooks may restrict collaborative feedback between practice tutors, placement module leaders and students due to the lack of visibility to all stakeholders concurrently. Collaborative internet based networks are extremely flexible [8] and amenable to all stakeholders in the management of the student learning continuum where placements are spread over a wide geographical area. Dynamic sharing of data in a seamless manner is important in the efficient assessment of student progress on placement but sharing of data in paper based systems can be problematic [10]. In Figure 1 below the dynamic flow of data to and from the individual clinical place record (IRCP), in this case study, necessitates live data being up to-date for all involved in real time. Many health professionals now view assessment using electronic logbooks / ePortfolios as fundamental to student progress through placement from novice practitioner to new professionals. An ELB provides the required visibility over time to allow for integrated assessment and student feedback when required ELBs enable students to acquire the competencies more efficiently which in turn allows them become new professionals [2], [4], [7], [8], [9], [11] used to a portfolio type passage through their training. This in turn establishes a good foundation for continuous professional development (CPD) for the healthcare professional.

Where the amount of data to be gathered is extensive and detailed, in this case study up to 6,000 data fields per student, the ELB is of huge advantage in that it can enable drilling down through keyword search to the particular competency required very quickly. Not only can ELBs allow for initial training they may also be easily scaled for data capture for CPD

throughout the healthcare professionals working life. CPD is now becoming part of the requirements demanded by regulatory bodies to allow professional healthcare workers continue in practice and is linked closely with patient safety. ELBs support the patient safety theme from this perspective [8].

Electronic Logbook Data Flows

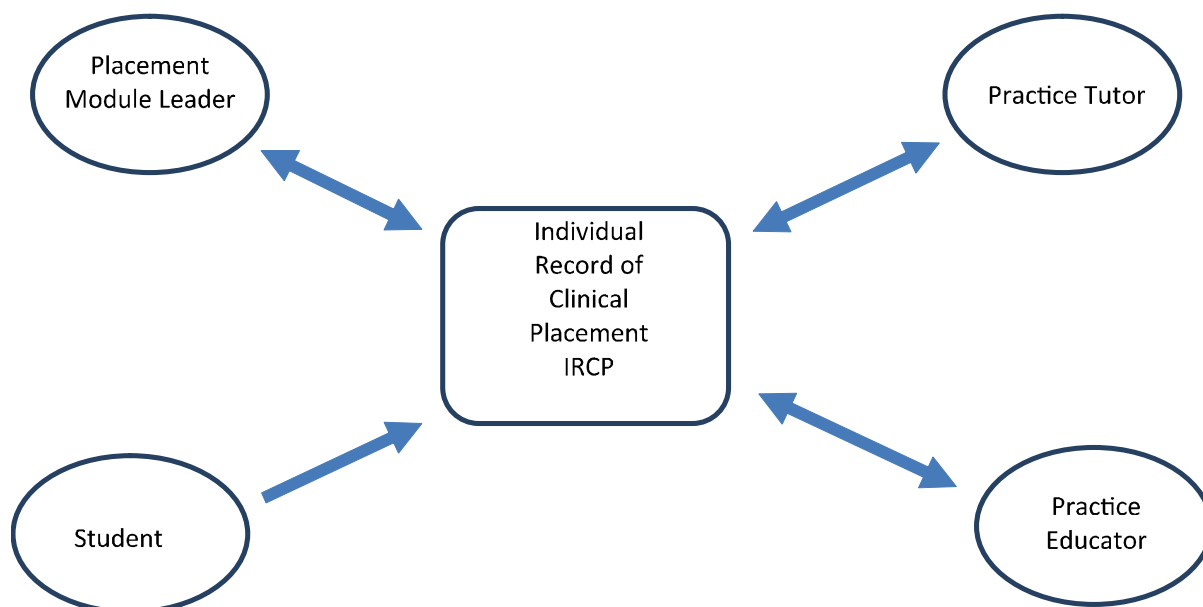


Figure 1. Audiology Logbook Data Flows.

The ELB also acts as a repository which may be of benefit to the student after qualification such as when they are seeking employment [12]. Briceland and Hamilton [11] conclude that the ELB can be valuable to show achievement in competency based outcomes. Competency standards are an ideal fit for ELBs [13] in that they are fixed measures of progress or milestones through a student's clinical training experience. National based standards such as the use of the MAINPORT [7] CPD system in medical education in Canada further underpins the acceptance of ELBs in the initial training and continuous professional development (CPD) of medical and allied healthcare staff. Sehmbi and Shah [14] outline how the use of an ELB in anaesthetist training is extremely critical given the unreliability of the paper based version used in many of 236 medical colleges in India. Brouwer and Kiroff [9] attest how the use of an ELB allows for a more accurate and informed assessment of a medical student. Fitch et al. [15] advise in their discourse that the ELB is extremely useful from the perspective of analysing results and making comparisons statistically on outcomes therein. In their paper on teacher training Jun et al. [16] found that the use of ELBs enabled the trainee teachers to have a keener understanding of the standards required of them. While Strickland and Islam [17] espouse the virtue and benefits of using ELBs in assisting with the teaching and assessing of the Canadian Medical Education Directives for Specialists (CanMEDS). In summary the sample papers perused here all extol the virtues of ELBs over paper based systems from many perspectives for example patient safety, professionalism, data analysis and CPD.

Developing a Solution

The problem needing a solution in this case study was the conversion of the paper based National Audiology Clinical Placement Logbook [6] into an electronic format that would satisfy the various stakeholder groups data flows identified in Figure 1 above. A typical paper record of a single competency is shown in Figure 2 below [6]. Each record contained up to 35 competency attempts.

The timeframe for deployment of this ELB was 6-8 weeks. The material available to the author at the outset was a word based version of [6]. Each student record had 331 individual line items required for the completion of his/her competency logbook. The HSE audiology lead in Ireland had come from the UK system and was expecting the functionality of UK BAA & universities computer based system.

Patient Preparation	Level	Date completed, initial & comments									
		1	2	3	4	5	6	7	8	9	10
A) Prepares the clinic room(s) ensuring that all the required resources are available and that the room and test environment are safe	O										
	P										
	FD										
A) Ensures that all equipment is working correctly and safely. B) Where appropriate performs stage A equipment checks or required calibration and records results.	O										
	P										
	FD										
A) Checks the patient identification details, identifies self to patient. B) Outlines reason for appointment and aims of the session, checks consent.	O										
	P										
	FD										

Figure 2. UK National Audiology Clinical Placement Logbook Sample Record

So the main requirements arising from stakeholders were the following:

- Practice tutors be allowed update all preparation, performing and interpretation at all levels of observation, practice and fully demonstrated pertaining to students allocated to him/her;
- Practice educators be allowed the same functionality as practice tutors save for fully demonstrated pertaining to students allocated to him/her;
- Students be allowed to view their own record so that they could monitor their progress on placement;
- Placement Module Leader be allowed view all student records so that they could monitor all students progress on placement.

The possible solutions open were the following. First the possibility of using the paper version [6]. This was discounted as being impractical and contrary to the commitment made in Professor Armstrong-Bednalls report [3]. Next the functionality of Microsoft Excel was explored to see if it could be adopted. This again was discounted as the functionality therein did not come near to meeting the specification required. The Department of Nursing and Health Science in Athlone Institute of Technology through its pharmacy technician programme had been using Student Diary Pro (SDP) an ePortfolio solution which was developed as add-on to Moodle for some time. However although this was a useful solution for pharmacy technicians its adaptation to audiology students placement was found not to be practicable due to specification requirements. The author then looked at the possibility of employing an external company to develop an ELB which would meet these requirements. Two such companies were engaged with, but timeframes and costs discounted these options. Finally the author investigated the possibility of developing a bespoke solution. The author having looked at the functionality required determined that a minimum the following elements needed to be part of the solution:

- A relational database was required here which could cater for all the various security levels;
- This solution needed to be online as audiology students would be spread over a wide geographical region during their placement;
- Web based ease of use for deployment and integration with Moodle was also important;
- The chosen platform had to fit within a small budget;
- The chosen platform had to be well established something which could be demonstrated by the evidence of a significant customer base;
- Rapid prototyping and systems development were also key given the tight timeframe.

The author decided a web based / cloud database platform might fit these fundamental requirements. After about a week's research Caspio was chosen as the platform to use. Caspio is an unconventional Silicon Valley technology company specialising in cloud based platforms. Caspio was chosen as it met all the fundamental criteria identified above. It also offered a free trial period which allowed time for prototyping and getting user buy in before any financial commitment was made to purchase.



FIRST NAME	SURNAME	SECTION NAME	SUBSECTION	TASK	MINIMUM_ATTEMPTS	LEVEL	D 1	PR	D 2	PR	D 3	PR	D 4	PR	D 5
Joe	Bloggs	A1 Pre Session Preparation	Room Preparation	A) Prepares the clinic room(s) ensuring that all the required resources are available and that the room and test environment are safe		0	05/01/2015	1	14/01/2015	1					

Records 1-1 of 1

[Logout](#)

Figure 3. Electronic Clinical Placement Logbook Sample Record

Next the development stage began. The first step was to convert the word version of the logbook [6] to a Microsoft Excel workbook. The reason for this was that the Caspio system could import data in this format and at go live time it was estimated that around 3,600 records would have to be imported as efficiently as possible. In Caspio a project was setup and the various related data files were created. Next the security and authentication for the various stakeholder levels identified in figure 1 were established. Finally what Caspio call ‘data pages’ were set up for each stakeholder view/update. Next some dummy data was loaded and functional testing of the solution began soon thereafter. When the author was happy with the functional testing a prototype of the ELB was created and used during a training day in the college for practice tutors and practice educators in order to facilitate user acceptance testing. The practice tutors and practice educators were satisfied with the prototype system after the user acceptance tests, which enabled the green light to proceed with full deployment. A user manual was prepared and uploaded to Moodle, the VLE used at Athlone Institute of Technology. Next the various ‘data page’ views were deployed to URLs. These URLs were embedded in the programme education pages for practice tutors and practice educators in Moodle. Finally go-live data was loaded and the ELB went live. Figure 3 is an example of a student competency record on the live ELB.

Conclusions

Many papers viewed in the literature [2], [9], [14], [15], [16], [19], [20] outline the increasing use of ELBs as part of clinical competency training for healthcare professionals. The question of quality control in training in competencies is coming increasingly under the microscope from various stakeholders such as funders, the professions themselves and service users. The sample papers perused in the literature review, in general espouse the positive attributes of ELBs over paper base systems. Deficits in areas such as data analysis and traceability in paper based system were traced through and highlighted earlier in the discussion. In addition it was shown that paper based systems are extremely cumbersome when it comes to stakeholder visibility in the clinical competency training environment. Advances in information and communications technology (ICT) in recent years, particularly in the domains of

infrastructure, relational databases, web technologies and cloud based computing solutions have enabled platforms to emerge which can allow rapid deployment of solutions such as ELBs. This paper is an example of a case study of the deployment of an ELB for audiology students undertaking a yearlong clinical practicum. This case study clearly delineates the use of a rapidly deployed cloud based technology solution into a clinical education setting. The platform identified and used in this case study is Caspio. This paper also found that the use of ELBs is not only beneficial in the initial competency based training of healthcare professionals, but the literature advises that ELBs have a very significant role to play in CPD for the entire career of the health care professional.

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EXPANDING THE ENVIRONMENT OF ADULT HIGHER EDUCATION BY PROMOTING WORKPLACE/UNIVERSITY PARTNERSHIPS AND THE USE OF INFORMATION AND COMMUNICATION TECHNOLOGIES AND SOCIAL MEDIA

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Paper Purpose

There are over three million adult learners in the USA with some college but no degree (Klein-Collins, 2010). The purpose of this paper is to describe the growing importance of higher education partnerships with workplace organizations for adult learners seeking academic degrees. It also explores the varying impact of information and communication technologies and social media in the classroom for this student population.

Introduction

Colleges and universities in the USA face criticism of their increased cost of tuition, lack of connection between academic learning and the workplace, and the need to provide students with 21st communication and information technology access (online courses) and materials (tablets, e-books). This is especially true for adult learners whose family, work, and societal responsibilities place additional burdens on how to complete their degrees in a timely and cost effective manner with practical outcomes as well as theoretical concepts. One way to address these concerns is through University/workplace partnerships that save all constituencies (workplace, university, and student) time and money to degree completion and have the potential to produce learning-outcomes advocated by all parties. As Ylikoski and Kortelainen pointed out (2012):

University – workplace partnerships are becoming increasingly important as the demands for authentic learning are growing. Partnership management ensures availability of authentic learning environments, joint – learning tasks, and knowledge – producing commissions for the students (p.i).

These joint ventures have the potential to mitigate the cost of a university education through the joint use of ICT resources and tuition discounts and provide the type of applicable learning adult learners are seeking. As Knowles (1989) pointed out, adult students are goal oriented and relevancy oriented. They are concerned with practical, problem solving and bring significant life and work experiences to the higher education classroom. Moreover, they

possess a degree of self-autonomy and self-direction (Blackmore, 1996) not shared by their tech-savvy traditional age counterparts (Berge & Collins, 1995). While the use of ICTs in the classroom and beyond is increasingly important to them, our observations indicate adult learners embrace a more hybrid learning model in which knowledge is co-constructed with guidance from the instructor-facilitator in distance and face-to-face interactions.

Method

Barry University's School of Professional and Career Education (PACE) has served an adult student population since the 1970s. This population's foray into higher education has primarily been connected to career advancement. The School has dozens of partnerships throughout the state of Florida to accommodate learners in its many sites beyond the main campus in Miami, Florida.

This paper explores the experience – over a five month period – with one partnership agreement in a single case study format as delineated by Creswell (2012). It begins with a brief discussion of the background of PACE's partnership agreements including legal and access concerns. This is followed by a more in-depth study of one of the school's partnership agreements with the Miami Police Department highlighting both the advantages and challenges of university/workplace school's partnerships and the use of ICT's and social media in learning environments.

The study relied on participant observations by the PACE team, document analysis, and verbal and written communications between both teams. This allowed for triangulation of the data. The teams consisted of the following members:

The Workplace team:

- Major, Director of Training Personnel Development Section MPD;
- Officer, Miami Police Training Liaison Officer;
- Administrative Aide II, International Policing Institute (IPI) Liaison, Residential Liaison.

The PACE team:

- University Legal Department;
- Assistant Dean of Partnership Agreements;
- Associate Dean of Marketing;
- Two Pace recruiters;
- PACE Students @ partnership site.

Data was analysed by comparing and contrasting observations, documents and verbal/written communication to reveal dominant themes among the data sources. The resulting themes are noted in the findings.

Findings

Two major themes resulted from the study. First, it underscored the opportunities and challenges of education/work partnerships. The study supported the importance of University/workplace partnerships for adult learners to expedite degree completion and lessen the cost of a college education through discounted tuition at off campus sites. Other advantages included the convenience of a workplace location and access to classrooms with ICTs. However, the uncertainty of long-term partnerships due to limited student access (closed site – organization employees only) and the time spent over the changing legal aspects of such agreements often rendered these associations less stable than hoped for by both parties. Still the study supported the need for partnerships between higher education and the workplace as essential to meet the needs of outwardly expanding learning environments in the highly mobile technology era.

The study's second theme concerned the role of ICTs and social media in teaching and learning for adult students. The ubiquitous utilization of ICTs and social media in education at all levels of learning underscore Daniels (2002) observations 12 years ago that ICTs were one of the basic building blocks of modern society. The proliferation of social media technologies research reflects an 11% increase in social media usage between 2008 and 2009 (Sarrel, 2010). This increase is attributed to the use of social media (Twitter, Facebook, LinkedIn, Smartphone Apps) in the workplace to recruit employees and new customers, build and maintain relationships with business partners and collaborate among various geographical structures within the workplace. Social media is also being utilized to provide training in the workplace environment. Several social media technologies are providing learning opportunities that cannot be provided in the organization.

Yet, this study indicated ICTs and social and digital media in education and the workplace environment did not resonate with all learners. In the case of adult learners they are generally more comfortable with a hybrid learning environment. A hybrid model approach provides them with additional learning opportunities while maintaining interpersonal communication. The study found that face to face sessions interspersed with synchronous or asynchronous sessions using a variety of technologies, including audio, video, computer or correspondence better suited this group of learners.

Conclusions

The use of university/workplace partnerships and the impact of ICTs and social media on student learning outcomes require further study to determine their role in the educational process and economic development (Kozma, 2011). The growing connection among educational institutions and the workplace underscore the need for the integration of these two venues with the judicious use of ICTs and social media in educational settings. It appears the education and workplace communities will continue to interact increasingly. The challenges to these relationships need to be resolved for the benefit of all constituencies.

Likewise, ICTs and social media while expanding learning environments are also engendering debates over learning outcomes. For example, does technology promote communication and critical thinking competences or is it primarily a source of information overload and no substitute for good teaching? Combining technological interactive online education relating to the subject matter, accessing various digital libraries to conduct research, and using social media forums to further the conversion in conjunction with excellent face to face instruction with the convenience of the workplace environment appears – from this study’s finding – to be the main preference of adult learners. The hybrid approach to both location and the use of technology allows these students to pursue educational opportunities at a pace that will not place a hardship on work and family commitments.

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ASSURING GRADUATE CAPABILITIES: A UNIVERSITY-WIDE STRATEGY TO EXPLOIT TECHNOLOGIES FOR GRADUATE EMPLOYABILITY

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In a sector focused on assuring standards while exploiting the affordances of digital technologies, Deakin University Australia set out to find new ways to assure student achievement of graduate capabilities, with a particular focus on evidencing learning and standards for employability – meaning that students and new graduates would be supported to acquire “the skills, understandings and personal attributes that make [them] more likely to secure employment and be successful in their chosen occupations to the benefit of themselves, the workforce, the community and the economy” (Yorke, 2006). Nine years after Yorke’s definition was published, employability challenges seem to have increased rather than diminished (Hinchliffe & Jolly, 2011; Smith, Ferns & Russell, 2014). Challenges include unpredictable economic conditions and increasing disruptive effects from new technologies (Allen & Seaman, 2013; Arum & Roksa, 2011; Deloitte, 2012; Greber, 2015; Norton, Sonnemann & McGannon, 2013; Sheets, Crawford & Soares, 2012; Smith, 2015). On the other hand, new opportunities arise from social networking platforms that offer graduates new ways of seeking and creating employment for themselves and others. The rapid rise of social networking for purposes other than purely socialising calls for graduates to have the digital literacy to know how to make their way in the world using platforms such as LinkedIn, Twitter, as well as Doximity for health professionals, Kaggle for data scientists and GitHub for software engineers (6 million registered users) (Bischke, 2014). In summary, employability challenges are increasing at the same time that technologies are providing individuals the opportunity to ‘be their own brand’.

Background: the Australian policy landscape

Australian universities have focused on graduate attributes for many years. In 2011, the websites of Australian universities were investigated to capture approaches to graduate capabilities or attributes (Oliver, 2011). In addition to discipline knowledge, the most common generic skills appeared in these broad clusters:

- Written and oral communication;
- Critical and analytical (and sometimes creative and reflective) thinking;
- Problem-solving (including generating ideas and innovative solutions);
- Information literacy, often associated with technology;

- Learning and working independently;
- Learning and working collaboratively;
- Ethical and inclusive engagement with communities, cultures and nations.

More recently, Australia's Higher Education Standards Framework (revised in 2014) requires that providers show how all Course Learning Outcomes (discipline knowledge and skills, generic skills, skills required for employment and further study, and skills in independent and critical thinking suitable for life-long learning) are demonstrated by all students who successfully complete the course (Higher Education Standards Panel, 2014). These standards come amid new concerns about changing employment conditions in a digitally disrupted economy: GradStats 2014, a summary of preliminary national data concerning the destinations and salaries of Australian resident bachelor degree graduates, reports deterioration in the short-term employment prospects of new graduates compared with 2013. Of those either in or seeking full-time employment: 68.1% were in full-time employment; 20.3% had a part-time/casual position while continuing to seek full-time employment, and 11.6% were not working and still seeking full-time employment. Interestingly, 13% of respondents were in or seeking part-time rather than full-time work, the highest proportions seen in the past decade (Graduate Careers Australia, 2014). Employment no longer necessarily means winning a traditional position in a company, organisation or institution. Increasingly, and particularly in some of the more dynamic and emerging industries, employment means graduates may gain employment or experience by creating companies, startups or businesses; freelancing; connecting and collaborating to create employment for others, particularly in new and emerging roles or engaging in social enterprises (McDowall & Cullinan, 2014).

This paper reports on the implementation of university-wide strategies at Deakin University to address the challenges, and exploit the technologies to effect wide-scale change for the University's 50,000 students, including those who opt to study online only (about one-third of the student cohort). In brief, the task was to refresh the curriculum and the digital spaces to assure engaging learning experiences for all students, and equip them with the capabilities to find either traditional positions and create new modes of employment in a digitally enhanced world. This work has been underway since mid-2012. With such a goal, it would have been tempting to focus solely on digital enhancements – in the case discussed here, extensive digital enhancements have been underpinned by pedagogies that focus on outcomes evidenced through active learner engagement – online and on campus. This is because, regardless of the learning space or tools, the literature in teaching and learning in higher education consistently confirms that excellent student learning is most likely to be achieved when:

1. Learning outcomes are clearly articulated and relevant to graduate destinations (Huba & Freed, 2000; Ramsden, 2003; Biggs, 2007; Penn, 2011)
2. Assessment and feedback are carefully designed opportunities to enable students to demonstrate, improve and evidence achievement of graduate learning outcomes (Nicol & Macfarlane-Dick, 2006; Race & Pickford, 2007; Yorke, 2008; Boud, 2010, National Institute for Learning Outcomes Assessment, 2010, Yorke, 2010)

3. Educators engage, enthuse and inspire (Chickering & Gamson, 1987; Chalmers & Fuller, 1996; Ramsden, 2003; Race & Pickford, 2007)
4. Learning experiences, on location or online, are highly and personal interactive and focused on engaging learners in authentic tasks and work-integrated challenges (Chickering & Gamson, 1987; Holmes, 1999; Mentkowski et al., 2000; Baxter Magolda, 2009).

These principles underpin Deakin's Agenda 2020 Curriculum Framework (Deakin University, 2014):

1. Expectations: Outcomes and standards clearly signal expectations and are aligned with the Australian Qualifications Framework.
2. Evidence: Assessment tasks enable compelling evidence of outcomes and standards, focusing on graduate employability.
3. Experience: Inspiring educators offer personal, interactive and engaging learning experiences and resources in cloud and located learning.
4. Enhancement: Emphasis is on systematic and systemic evidence-based enhancement of courses.

Implementing a University-wide approach: first, design for evidence of learning outcomes

To ensure focus, the first tasks included devising and implementing the curriculum framework and the institution's agreed 21C graduate capabilities, expressed as the Deakin Graduate Learning Outcomes (see Figure 1). The second challenge was to work intensively with staff to devise new tools and systems to

- define degree-level Course Learning Outcomes and Standards, aligned with unit learning outcomes and assessments, and ensure these were communicated consistently in course documentation and learning management systems (including consistent use of icons in Figure 1)
- analyse how those Course Learning Outcomes and Standards were embedded, assessed and evidenced throughout the course, and make enhancements, including deploying engaging digital learning experiences. A particular focus has been to reimagine assessments and prompt students to create and curate artefacts that can be shared with potential employers.

This work was very detailed and intensive: it is not easy to change the hearts, minds and practices of teaching staff. Nevertheless, staff have embraced these initiatives with various degrees of enthusiasm.

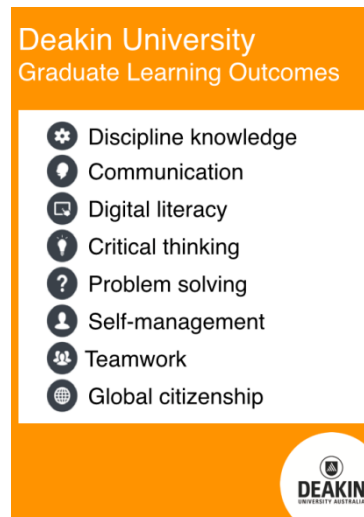


Figure 13. Deakin's Graduate Learning Outcomes

Implementing a University-wide approach: next, reimagine the digital environments

The University implemented a new learning management system (LMS) in 2012 – Blackboard was replaced with Desire2Learn, and the system was known by various acronyms such as DSO (Deakin Studies Online) and also D2L (for Desire2Learn). In spite of its newness, the LMS had a look and feel that reflected its design as a content repository – it seemed to be a ‘book on a screen’ design, with little visual engagement, and opportunities to engage with other learners was possible but not a highlighted feature. It was in stark contrast to the engaging environments in which contemporary students engage.

Reconfiguring a learning management system is very challenging, technologically, and in relation to user adoption, particularly when seeking to reimagine pedagogy from a focus on content to a greater emphasis on outcomes and engagement. The University offered a Massive Open Online Course (MOOC) in 2013, using a bespoke platform created with Janison: the new environment was a blank canvas designed from scratch to that enable a more engaging focus on evidencing learning outcomes through five main areas:

- Learn: by accessing resources such as expert commentary and interviews, and by applying their knowledge and skills in an interactive scenario
- Engage: agree, challenge or question others’ ideas
- Network: with humanitarians and peers from across the globe
- Evidence: understanding of the field and generic capabilities by creating up to six learning exhibits in an online portfolio
- Credit: give and receive peer credit and feedback on others’ learning exhibits. In addition, a limited number of participants will be able to apply to earn credit towards a Deakin University qualification.

Deakin's MOOC

The MOOC was never intended to become the University's LMS – instead, it was as an example with staff and students to show how the system could look. Importantly, the learnings from DeakinConnect informed the redesign of the learning management system with agreement that every unit site in that system would be designed to meet four broad minimum standards for easy access to:

- Goals: clear and consistent information about learning outcomes, assessment and feedback
- People: teaching staff, a peer learning community, and learning support (study skills, career support, and so on)
- Learning resources: information, including captured lectures (where possible, in bites of up to 15 minutes), texts, web resources and so on
- Learning experiences: places or spaces to gather and connect with people, usually through organised classes, seminars and events, either on or off campus or both

Subsequently, all unit sites have a consistent and more visually engaging look and feel, as shown in Figure 2.

DeakinSync

More importantly, the University has invested in creating an overarching digital hub where all students (and staff) can connect and engage in all their University experiences, including accessing information, support, fees, seeking directions and advice. DeakinSync, named by students, enables all students to log in to one single place, and access all services – including intercampus bus timetables, book a university computer, order a coffee at a campus outlet – as well as have direct entry to the units in the learning management system. As seen in Figure 2, all students have access to connectivity tools (Lync) which enables them to speak through video calling. From 2015, students have 24/7 access to live student support powered by IBM Watson. In its first phase, Watson can be asked general 'how to' questions: for example What do I need to do to enrol? What social activities are available at Deakin? Where do I find the biology building? What are the computing requirements for my course and are there any discounts for students? Advice powered by IBM Watson will assist students to have a positive student experience from day one.

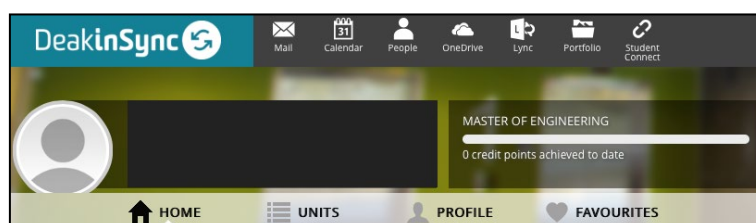


Figure 14. DeakinSync gives access to portfolios and connectivity tools to all students

Deakin's Curriculum Framework and Course Enhancement Process include systemic institutional focus on reimagining assessment as an impetus to have students create and curate artefacts that demonstrate their achievement of the Course Learning Outcomes and Standards. A key challenge has been to implement a portfolio approach to assuring the Course Learning Outcomes and Standards. For some time, the literature related to eportfolios has acknowledged the known challenges of interoperability, and the difficulties graduates face in extracting their information after graduation (Chen & Light, 2010; Hallam et al., 2010; Joyes, Gray & Hartnell-Young, 2010). In addition, not all course leaders wish to mandate the use of an ePortfolio tool. To address this, several tools have been made available to all students in the header of DeakinSync. This enables students to curate their evidence of learning: they may choose cloud storage (OneDrive) or a Portfolio (the D2L ePortfolio tool has been elevated to be a whole of degree tool, as well as available in units). Students are encouraged to curate assessment artefacts as evidence and build their employability profiles safely and professionally through networking and social media. This is underway – to various degrees – in the vast majority of Deakin courses.

Strategies to enable students

Course leaders have responsibility for graduates – to some extent. One of those responsibilities is to ensure graduates can take responsibility for themselves, and articulate evidence of their capabilities to potential employers, or to create their own employment. GradStats 2014 (Graduate Careers Australia, 2014) reports that just over half of domestic bachelor graduates first found out about their job in one of these three ways: advertisement on the internet (25.7%); through family or friends (13.9%) or through university or college careers service (12.4%). Clearly, students use digital channels – as well as personal networks – to seek employment.

Me in a Minute

Deakin has implemented the Me in a Minute providing all students with the tools to showcase their achievement of capabilities and make their one-minute video pitch to prospective employers. Students (particularly from creative and digital arts) are employed to assist peers produce a one-minute video during which they reference up to three Graduate Learning Outcomes to articulate their achievements and employability. The video closes with a screen that says 'Connect with [name of student] on LinkedIn'. The video is then uploaded to the Me in a Minute site, as well as the Me in a Minute YouTube channel, and owning students are urged to share and disseminate the video on social media, also by using the profile tool in DeakinSync.

Deakin Hallmarks, piloting 2015

Assessment throughout Deakin courses is designed to provide students with the opportunity to evidence achievement of all Graduate Learning Outcomes. However, few assessment tasks are related solely to one Graduate Learning Outcome, and assessment artefacts rarely highlight outstanding achievement in those employability skills such as communication,

digital literacy, teamwork, critical thinking, problem solving, self-management, teamwork and global citizenship. In 2015, Deakin course leaders will pilot digital credentialing to warrant outstanding achievement in these Graduate Learning Outcomes. These credentials, called Deakin Hallmarks, are awarded at course level using digital badging implemented within DeakinSync. Course leaders will collaborate with industry to design extra, optional course-level assessment where students can apply to present their evidence for outstanding achievement. Course leaders will highlight Hallmarks associated with skills that employers and industry see as crucial but scarce in new graduates. Deakin Hallmarks will be issued and displayed in the DeakinSync profiling tool (see four coloured crests, top right, in the Figure below), which can be shared publicly through social media. As seen below, students can also voluntarily display other artefacts that they believe evidence their achievement of the Graduate Learning Outcomes (see Achievements).

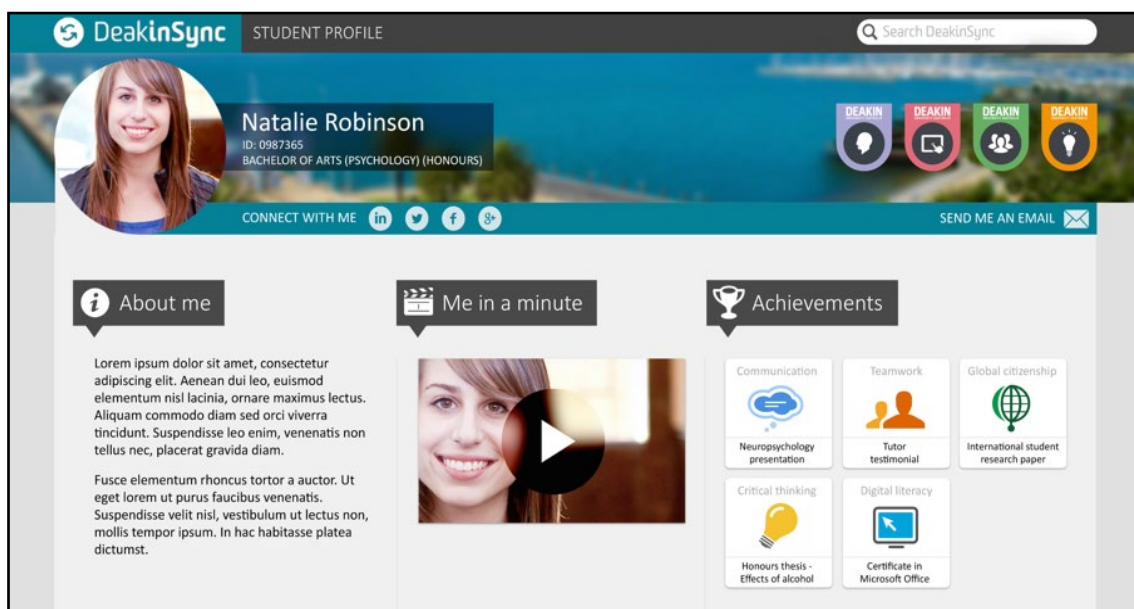


Figure 3. DeakinSync profiling tool enables students to share their evidence of learning outcomes on social media

Conclusion

Deakin's LIVE the Future strategy has been underway since July 2012: by the end of January 2015, the vast majority of its 250 degree courses have been enhanced so that there are clear Course Learning Outcomes and Standards, assessments are reimaged to capture evidence of authentic learning, and students have the tools to enable them to create and curate artefacts that evidence their achievement for employability. Much has been done, and there is still much to do. However, employability is a difficult concept to define, and who knows why a particular graduate is successful in gaining or creating employment – in all likelihood, it will be a multitude of factors. Even so, universities are obliged to deliver on community expectations, and ensure that their graduates are prepared for success. The strategies discussed here are predicated on a fundamental premise - that however tempting it may be to leap to digital solutions, the first challenge requires articulation of a curriculum framework, and

capacity building with teaching staff, to enable its implementation. Once the pedagogical path is defined, digital strategies are somewhat clearer to signpost and deliver.

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21ST CENTURY CITIZEN SKILLS: DIGITAL COMPETENCES IN EDUCATION. CASES IN CATALONIA.

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Abstract

Among the skills that every citizen should have acquired in the 21st Century, you have digital competences, which allow them to develop fully in a digital society that requires higher-order learning (Fields, 2011). In this document, the analysis of the strategies used in three different schools to promote the acquisition of digital skills of their students will be discussed. Through three case studies framed in the doctoral thesis “Classrooms 2.0. teacher’s Vision, uses and development of the digital skills of students. Cases in Catalonia” conclusions will be presented on the proposed topic.

ITC in education

Over the past decade countries around the world have initiated educational policies that have allowed the influx of ICT into classrooms, encouraging students to be trained competently to new challenges and demands of the digital society which are immersed (Alonso, Area, Guitert et al., 2012). We have to bear in mind that the revolutionary power is not in the technology itself, more important is the function of its applications (Veletsianos, 2010). We are witnessing the creation of a new culture of learning that helps in the growth of higher intellectual capacity such as imagination, to face an uncertain future (Adell & Castañeda, 2012). We refer to what Fields (2011) calls “creative ambiguity” and it involves the use of creativity as a condition of development of an individual or a group. We must overcome the traditional concept of literacy and be aware that other aspects, such as navigation, can become the basis for the cultural literacy of citizens of the next generation (Thomas & Brown, 2011). In addition, we are facing a new situation as far as the classic concept of generational authority and teacher is concern: it is possible to find a situation where the students show greater mastery of the tools (digital) than their elders (Dede, 2007).

In this new social scene, the arrival of technologies brings new possibilities to enhance and enrich the experiences of citizens (Kober, Oztop & Peters, 2010). This new society poses great challenges to educational systems, the foundations of which have been removed, requiring that the school guides the students in acquiring digital skills that will enable them to be citizens able to cope with this new society, acquiring the ability to learn throughout life (Pérez, 2012).

Introduction to digital competences in the framework of Catalonia

We define competence as the ultimate ability of a subject not only to make use of all the capabilities and resources available in their environment, including their own abilities, acquired and inborn. Also is the ability to make use of all, to address situations -issue; that is why ability is measured in concrete action (Marco, 2008, p.19). According Aguaded and Guzmán (2014) there are some reasons that explain the needs to work on digital skills in classrooms:

- Because the school has to integrate with the technological culture of his time.
- Because students are regular users of technology.
- Because the school is to prepare young people for the future society (and this requires training in technological skills).
- Because media education can help innovation and improving school educational processes

The inclusion of skills in the curriculum has several purposes¹:

- First, integrate different learning, both formal, incorporated in different areas or subjects, such as informal and non-formal.
- Second, allow all students to integrate their learning to relate them to different types of content and use them effectively when it is necessary in different situations and contexts.
- Thirdly and finally, guide teaching, to help identify the contents and evaluation criteria that are essential character and generally inspire the individual decisions on the process of teaching and learning.

As proposed by the LOE, current education law in the Spanish context, the main purpose of digital competence is learning to transform information into knowledge. This ability incorporates different skills, ranging from access to information to transmission, using various media, including the use of information technology and communication as an essential tools to know, learn and communicate.

As part of the 2020 Strategy (ET-2020²), the European Union has set educational objectives to help achieve a smart, inclusive and sustainable economy. Catalonia in his line of pioneering initiative use of ICT for learning (Alonso, 2012) published two documents during 2013/2014 relating to the abilities in a digital environment (which, given the transversal and instrumental character are linked to all curricular materials), differentiating between primary and secondary education. These documents grades the absorption of digital abilities, identify key content and pose evaluation indicators related to different degrees of assimilation. This documentation will serve as a guide to determine how and to what extent the digital skills are worked from three schools investigated.

¹ Annex I of Royal Decree 1631/2007, of December 29.

² Information available at

http://europa.eu/legislation_summaries/education_training_youth/general_framework/ef0016_es.htm

The research and its methodology

As part of the research entitled “*Classrooms 2.0. teacher’s Vision, use and development of the digital skills of students. Cases in Catalonia*”³, there have been case studies in three schools. We understand the case study as one that focuses on the description, understanding, prediction and control of the singular (Woodside, 2010).

Thus, we are faced with a collective case study, presenting and combining various complexities and peculiarities of individual cases (Stake, 2010). Knowing that the case study approach allows different realities, has ensured to show significant differences in selected centres. Thus, we have provided both primary schools and secondary schools, public and private schools as well as centres in well-off areas and disadvantaged backgrounds. When working with case studies you have to take into account that these allow us to understand and find evidence, but not generalizing it to other realities (Stake, 2010).

In this research mixed methods has been used, combining quantitative data sources (surveys) and qualitative (interviews, observations and focus groups) to conduct research as one study with multiple phases (Creswell & Garrett, 2008).

Table 17: Summary of the number of interviews, focus groups and observations made in each centre

	Escola Projecte	Institut Barri Besòs	Escola Arenal de Llevant	Total
Observations	33	35	35	103
Focus groups	1	1	1	3
Teacher interviews	4	5	3	12

Brief introduction to the analysis of job skills in schools

From this study we have analysed the proposals designed by schools to develop educational skills of students from the axes of development of digital skills⁴ specified by the Catalan legislation⁵. Then each competence will be illustrated with an example of observed classroom use.

Dimension (technological) tools and applications:

- Competence 1: Select, use and program digital devices and functionalities according to the tasks. Example: completion of a project that includes programming in Scratch and based on the reaction of an element through an external sound stimulus (Escola Projecte).

³ Doctoral thesis. Azucena Vázquez Gutiérrez as author and Montse Guitert Catasús as director, part of the research group on education and IT Edul@b (UOC).

⁴ The dimensions are common for primary and secondary stages, while the powers differ slightly. This document has seen the high school version.

⁵ The documents relating to the regulations referenced are available at the following link: <http://www.xtec.cat/web/curriculum/competenciesbasiques/ambitdigital> (consultation conducted January 17, 2015).

- Competence 2: Use the text editing applications, multimedia presentations and numeric data processing for the production of digital documents. Example: in the project “Does the courtyard, a space for everyone?” students of Arenal de Llevant use Google Drive to work on creating a collaborative group text document hypothesis, a spreadsheet to collect data and a multimedia presentation to show results.
- Competence 3: Use basic editing Applications for still image, sound and moving image to produce digital documents. Example: under the project created with Scratch, students of the School Projecte edit images to include in their proposals.

Dimension of information processing and organization of work and learning environments:

- Competence 4: Find, compare and select appropriate digital information for the work to be performed, considering various sources and digital environments. Example: selection of information for the project Old Olympic Games (Escola Arenal de Llevant)
- Competence 5: Build new personal knowledge by information processing strategies supported by digital applications. Example: creating presentations through which students explain whether their hypotheses are true or false after performing a small research project (Escola Arenal de Llevant, regarding changes undergone by the body during sports).
- Competence 6: Organize and use a personal environment for working and learning with digital tools to develop in the knowledge society. Example: Creating a collaborative document GoogleDrive to present ideas on creating projects (Escola Projecte).

Dimension of interpersonal communication and collaboration:

- Competence 7: Participate in interpersonal communication environments and virtual publications to share information. Example: use email to communicate with the group and the teacher (Escola Arenal de Llevant).
- Competence 8: Perform group activities using virtual tools and collaborative work environments. Example: Create a programming project in pair with Scratch (Escola Projecte).

Dimension habits, citizenship and digital identity:

- Competence 9: Carry out citizenship and personal development, using their own digital resources of modern society. Example: participation in games that reinforce the contents of Technology worked in classrooms (Institut Barri Besòs).
- Competence 10: Encourage healthy habits ICT related to ergonomics for the prevention of risks. This competition has not been treated in any of the sessions observed in the case studies.
- Competence 11: Acting critically and responsibly in the use of ICTs, considering ethical, legal, security, sustainability and digital identity. Example: use of free elements to create Scratch projects (Escola Projecte).

Some conclusions

Several conclusions where derive from the analysis of the data pertaining to this investigation, among which are the following⁶:

- The proposal of the centres regarding the treatment that is giving to ICT as well as the position of the management team regarding these, has a great influence on competency dimensions for work in the classroom.
- Perceived differences in classroom practices when dealing with different dimensions of competence, being those related to classical office which are more present (especially competence 2).
- The teacher shows a tendency to always work the same digital competencies within their classrooms (especially related generic applications), while there are others who rarely work (especially those relating to healthy habits in the use of ICT).

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DEVELOPING PROFESSIONAL IDENTITY IN AN ONLINE LEARNING ENVIRONMENT: PERSPECTIVES OF PEER INTERACTION

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Abstract

From a socio-cultural perspective, the development of a professional identity is an on-going process that is social in nature and negotiated in communities of practice (Wenger, 1998). Internships in higher education function as such communities of practice, with an improved sense of professional identity as the outcome for the intern. This paper describes the interactions in an online learning environment. The online platform sought to enable peer interaction between younger and older students in a discussion of the professional identity of Natural and Cultural Heritage Management (NCHM) professionals. By analysing user data and through a qualitative data analysis approach inspired by Creswell (2014), defining themes of NCHM professional identity are identified. Thus suggesting that a discussion of professional identity can be facilitated in the current setting and indicating a need for designing educational activities with this purpose.

Introduction

In the spring of 2014, fifteen 4th semester students of the Natural and Cultural Heritage Management programme at UCN, Denmark, left the safe environment of the education to fill out internship positions at public and private corporations both locally and internationally. It is a well-known mechanism that internships are a natural booster of the somewhat elusive concept of professional identity, which will be elaborated in a later section. The students return from internships with a better understanding of what they do, know and who they are professionally (Dehing, Jochems & Baartman, 2013). Meanwhile, the younger students of 2nd semester continued their daily life of classes, assignments and project work.

From a socio-cultural perspective, the development of a professional identity is an on-going process that is social in nature and negotiated in communities of practice (Wenger, 1998). This position supports internships as an educational activity. Interns participate in the community of practice of the internship host, thus for a period becoming a member of that community. In this process the interns negotiate their identity as professionals. This identity negotiation is part of each student's individual learning trajectory.

Despite – but not ignoring – the social nature of identity development, the learning that takes place for the intern remains individual and is typically only shared with a supervisor. The purpose of this paper is to explore whether this individual learning can be shared with peers by forming an online community of practice of students. The importance of peer relations and peer mentors in relation to professional identity is supported by research results by e.g. Perry (2012) and Duemer et al. (2002). This paper describes the interactions in an online learning environment that sought to enable internship students at 4th semester and younger students at 2nd semester to interact in a discussion of the professional identity of Natural and Cultural Heritage Management (NCHM) professionals.

Context and description of online intervention

The Natural and Cultural Heritage Management programme (NCHM) educates students to plan, manage, and carry out events and communication tasks in public and private businesses within experience economy, including tourism. It is a three-year programme of six semesters, and the fourth semester is dedicated for internships. Previous internship hosts include zoos, advertising agencies, libraries, public offices, museums, event agencies, tourist agencies, etc.

At the end of each semester a “semester fair” is held, where students from all semesters present their activities to each other in pecha kucha form¹. During the daylong semester fair, coffee and lunch breaks are planned, but room for discussion and questions that might arise from the presentations is not scheduled.

A digital discussion forum was set up to facilitate a discussion of identity related issues across semesters. The platform chosen was the learning management system of the institution. The forum was open only to the students and two moderators. No anonymous postings were allowed. A research team had, based on the theoretical framework regarding professional identity as described below, previously defined six discussion topics in the forum. The forum was open throughout the day, thus providing a platform for reflections and discussions that might otherwise have been left unformulated and implicit, and facilitating both synchronous and asynchronous postings.

Professional identity

An initial literature review unveiled a wide selection of scholarly publication dealing with professional identity. The definition of professional identity in this paper is based on the works of Ibarra (1999), Sullivan (2004), Sheppard, Macatangay and Colby (2008), Beam et al. (2009), Perry (2012) and Dehing, Jochems and Baartman (2013). These works describe functional, individual and social dimensions of professional identity. Combining these positions, professional identity may include the following characteristics:

¹ Pecha kucha is a presentation format where a number of participants each show 20 elements, using exactly 20 seconds pr. element with a total presentation time of 6 minutes and 40 seconds pr. person. This format has the advantage of tightening up presentations, and allowing the presenters to present thoughtful, concise points that enhances their talk.

- Seeing the breadth and depth of task and jobs of the professional;
- Knowing and using technical terms specific for the professional;
- Developing with practical experience;
- Knowing and using discipline-specific tools (physical and/or digital);
- Positioning yourself and being positioned by others as a professional;
- A relatively stable individual combination of character traits and values.

These characteristics were operationalized into six questions for discussion. The questions formed the topics of the forum.

Table 1: Questions for forum

Question 1	Which types of tasks or jobs do you identify from the internship presentations?
Question 2	Did the internship presentations give you any insight into technical terms that are important for the NCHM professional?
Question 3	Did the presentations give you any insight into the role the internship has played for the interns' perception of themselves as NCHM professionals?
Question 4	Did the internship presentations give you any insight into the tools that are important to know and use as a NCHM professional?
Question 5	Did the presentations give you any insight into the expectations of the internship host?
Question 6	Did the presentations give you any insight into whether it requires special personal qualities to solve NCHM tasks?

Data & Analysis

In the academic year of 2013/14 the number of 2nd semester students at the NCHM programme totalled 26. Of these, ten were present at the semester fair and, based on forum data, five were active in the forum. On the 4th semester, the total number of students was fifteen. Of these, six were present at the fair and three actively participated in the forum. However, during the fair it could be observed that several students used their device of choice (typically a pc or tablet) in collaboration with a fellow student. They would discuss their posting verbally and then one would type. Accordingly, it must be assumed that the number of participants is actually higher, even though it cannot be supported with user data.

The data for this study include user data and 76 board postings from students and forum moderators during the semester fair. Naturally, no claim is being made that the participants and respondents are representative of the whole group of students. A qualitative data analysis approach inspired by Creswell (2014) is applied to identify themes in the postings.

Findings and analysis

Data on use

Overall, the students had a participation rate of 50%, as is shown in Table 2, although this might have been higher due to the user patterns observed as noted above. Out of 46 student postings, 2nd semester students made 33 and 4th semester students made 13, resulting in a ratio between 2nd and 4th semester postings of approximately 72/28%. The ratio between 2nd and 4th semester students present in the forum was 63/37%.

Table 2: User data

	2nd semester	4th semester
Students present at fair	10	6
Students active in forum	5	3
No. of student postings	33	13

Individual student postings range between 1 and 11 per student, with an average of 5.8 per student. 2nd semester students average at 6.6 postings per student, and 4th semester students average at 4.3.

Table 3: Individual student postings

Semester	Student ID	No. of postings	Average no. of postings
2 nd semester students	Student a	11	6,6
	Student b	8	
	Student c	4	
	Student d	1	
	Student e	9	
4 th semester students	Student f	7	4,3
	Student g	4	
	Student h	2	

Thus, the data suggest that 2nd semester students were more active than 4th semester students on average. However, no reliable conclusions can be made on the basis of the small amount of data. Furthermore, possible explanations for the difference between 2nd and 4th semester posting rates can be hypothesized. For one, 4th semester students took turns doing presentations in the same period of time, so some will have been absent during parts of discussions. Secondly, the outnumbering of 4th semester to 2nd semester might have made 4th semester student more hesitant to post. Third, it is possible that the discussions appealed more to the 2nd semester students due to a presumed lesser knowledge of the practices of NCHM professionals. Thus, they might have been more motivated to participate.

Finally, the cohort and data are of such a limited size that it is not possible to rule out that a difference between 2nd and 4th semester students, could be a matter of personality; that the individuals of 2nd semester are simply more outspoken than the individuals of 4th semester. A more qualitative data collection including interviews would cast light on these issues. However, this was not possible due to the fact that the students went on summer holiday after the conclusion of the semester fair and were therefore out of reach.

Themes of NCHM identity

Three major themes regarding the professional identity of NCHM professionals were identified in the analysis of the forum postings. The postings were made in Danish and have been translated by the author of this paper.

Communication – not nature and culture

The students were quick to define a range of tasks and concepts of importance to the NCHM professional based on the internship presentations. What stand out in these definitions are not necessarily the words mentioned, but the lack of others. All the tasks and concepts mentioned relate to communication and project management, not nature or culture. The absence of natural and cultural concepts is striking. Asked about this, one student answers:

“Because we have a lot of communication theory and this is a communication education, we are probably very focused on whom we communicate with and to. And you have to place yourself in between other professions.” (Student, 2nd semester)

Another student confirms that:

“(...) there is a good balance between the expressions we hear in the education and those that are being used in the internship.” (Student, 4th semester)

Thus, the students define themselves as attending a “communication education” and that this reflects the practice they educate themselves for (or the other way around). After being asked whether they had expected that making advertising initiatives would be part of their tasks as some interns had experienced, a student answers:

“In our profession we don’t speak much of advertising, but of communication and dissemination. Which naturally often is the same thing.” (Student, 4th semester)

What is interesting here is of course the quick return to “communication”, rather than the word “advertising”, but also the use of the phrase “in our profession”, indicating a feeling of professional identity, that positions the profession of NCHM as different than others.

They don’t know us – I need to prove myself

The postings and themes in this area are focused on a paradox that many students seem to experience. The students’ concur that NCHM professionals must be able to perform a wide variety of jobs and juggle different tasks and that this is true for all NCHM professionals. However, it seems that this is more a matter of necessity than skill or competence, here expressed by a 2nd semester student:

“Because many people don’t know exactly what we can, I think it’s very important to show that you can work with a range of different tasks.” (Student, 2nd semester)

And she continues in a later post:

“But it might yield greater expectations for us than we can fulfil – so there most definitely can be disadvantages because we might function as anchor

persons without having sufficient competence or knowledge for it.” (Student, 2nd semester)

Several of her co-students of both semesters support this, calling it “being stuck between a rock and a hard place”. This is also related to the reflections in the theme above. The students do not define themselves as specialists in nature and culture, but more so generalists, facilitating and supporting communication and project work processes in organisations that happen to do business in nature and culture related disciplines. They clearly separate themselves from the profession of nature guides, however they do experience being confused with these.

Independence vs. collaboration

The third theme identified is that the NCHM professional moves on a continuum from working independently to working collaboratively. Many students mention the need to be outgoing and grabbing tasks, as one student put it:

“You have to take the driver’s seat and don’t wait for them to come to you.”
(Student, 2nd semester)

Another student takes it in a different direction by highlighting the importance of:

“Patience and time for reflection” (Student, 4th semester)

Several postings relate to this continuum and it’s the core of a central negotiation. One student makes an inquiry into how to find the balance between collaborating and being independent. Other students reply to this, with one highlighting the group work of previous semesters as beneficial training in this aspect, and another by suggesting how the internship can support various learning goals depending on the individual:

“I’m thinking that before (the internship, ed.) you need to consider what you want out of the internship, there’s a big difference whether you want to learn about a specific area/collaboration or be capable of running/administering a project” (Student, 4th semester)

Furthermore, several students relate the need for being independent and outgoing to what’s already mentioned above; that NCHM professionals are quite unknown and that as consequence of this, internship hosts are unsure of what kind of tasks to give to the intern.

Conclusion and reflections

As previously mentioned, no claim is being made for the representativeness of the data. The small sample is not eligible for generalisations; however, it does provide some insights into the development of professional identity of NCHM professionals between peers in an online community of practice.

User data suggest that a discussion of professional identity can be facilitated in the current setting with participation of both 2nd and 4th semester students. Contributing to the user data is a qualitative assessment of the content of the online learning environment. By analysing the students' postings, three shared themes of essence to the identity of NCHM professionals were identified. The nature of the themes could possibly indicate that professional NCHM identity cannot be summed up to specific characteristics or functionality (nor was this ever the intention) but is characterized by a number of dilemmas or paradoxes.

The continued negotiation of professional identity of NCHM professionals, not least necessitated by the ignorance of e.g. employers, indicates the relevance of designing specific educational activities with this purpose. Such activities could revolve around the identification of shared dilemmas.

This study has focused on the interactions of 2nd and 4th semester students in an online discussion forum, suggesting this to be beneficial to developing professional identity. The study requires further elaboration on topics such as the role of the moderator and the functionalities of the specific platform. Furthermore, the pedagogical construction of the activity is essential to explore, both with regard to defining relevant themes of discussion and to ensure student commitment and integration in other educational activities. More data points are needed to cast light on these topics.

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PERCEPTIONS REGARDING STUDENT WORKLOAD FOR LIFELONG LEARNING SKILLS IN A RANDOM ONLINE SHORT TERM ENVIRONMENT (ROSE)

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Introduction

Lifelong learning (LLL) is a new concept in pedagogy afforded by the Information Revolution, which requires high time management skills on the part of the student in order to assure Work-Life Learning Balance (WLLB), meaning a balance of the professional, family and academic activities (Romero, 2011). It is crucial that higher educational institutions gain experience with new pedagogies supported by ICT that take into account these two concepts and learn to dynamically update their knowledge and methodologies through experimenting with various forms of e-learning e.g. short-term courses and hybrid blended-learning (hybrid b-learning).

An intensive online environment over a limited period of time is a form of hybrid b-learning that could be a solution for situations when it is impossible to operate the educational system on a K-12 and a higher education level. The 1989 Convention on the Rights of the Child stipulates that children have a right to education, and indeed, children and young people living under such circumstances should not be deprived of their right to a continuity of learning during these periods (Sinclair, 2001). Situations may arise in areas of conflict in which occasional outbreaks of tension disrupt normal routine, or in areas prone to extreme weather occurrences or outbreaks of disease. A continuation of studying can be achieved, at least partially, by utilizing technology, not only to bridge the spatial gap, but also because technology, when used well, has the potential to preserve and nurture a sense of community. This can also support students during these times, serving as a tool to keep track of students in order to help them cope with learning. Furthermore, continuing with life as normally as possible can help overcome emotional difficulties and trauma, contributing to community resilience (Foa et al., 2005, Leykin et al., 2013).

This paper presents the results of research carried out on an online week held in a teacher-training college in the north of Israel during 2013/2014 and 2014/2015 where the entire college body, students and faculty, participated in the two events. This paper concentrates on student workload as it appeared to be one of the most prominent issues. We believe that

results here could help plan successful and meaningful online venues by assuring work-life learning balance for life-long learners.

Background

Many situations may arise which frequently cause disruptions of the school year due to weather conditions, political unrest or military tensions, preventing the opening of schools. These may routinely span a week, at least. It is important that teacher-trainees gain experience in such an environment from a pupil's perspective, while at the same time understand the pedagogical challenges associated with distance learning.

Ohalo Academic College, an institution of higher education and teacher-training in Israel, substituted all face-to-face lectures with online with an online venue for students and lecturers to learn and teach. This online week was purposely planned to take place during the "Hanukkah" week because pupils of elementary and high schools in Israel are at home on vacation. This emulates a situation in which the routine academic year is disrupted or when teachers and students are required to continue their academic activities.

We coined the term **Random Online Short-term Environment** (ROSE) to designate an unplanned online learning environment that continues for a limited period and should function as a seamless continuation of routine face-to-face learning. During a ROSE, students study in a space which is not always suitable for learning, in which the technological resources could be limited and the learning process can potentially be disrupted due to the fact that other members of the family share the same space. In addition, there might be occasional external disruptions, as the need to seek temporary shelter, electricity outages etc. Although ensuring a continuity of learning during these periods is a challenge, it is important to conduct research and design for this kind of environment.

Literature Review

Generally speaking, there is limited amount of research into online learning as a tool for dealing with emergencies. Thus a research of websites of the 50 state flagship higher education institutions in the United States to investigate whether and how online or distance learning were included in the institutions' emergency plans as solutions to disruptions, such as H1N1, found that only one-third included suggestions to faculty to find alternative ways of delivering courses, using technology or specific tools to do so, but only one of these institutions actually mentioned online learning (Meyer & Wilson, 2011) .

There are limited references to a short term online environment on the website of The International Association of K-12 Online Learning (iNACOL). It seems that only Singapore has taken the initiative to address unplanned disruptions of the school year on a nationwide scale, following an outbreak of SARS in 2005. A drill of one week online learning is held annually, using e-learning and blended learning models (Teck, 2012). An online week held annually can therefore serve as a laboratory of sorts for researching and designing a ROSE,

although activities are planned ahead, unlike an authentic ROSE which is unplanned for by definition.

It is desirable to create a seamless continuation between face to face meetings and the ROSE. Using a LMS routinely can be of great help in this aspect (Sofia & José, 2014). In creating activities for the ROSE it is imperative that faculty understand the difference between face to face and online learning, particularly in terms of workload. Workload stemming from difficulties in balancing work/life/study has shown to have an impact on student participation in higher education (Lowe & Gayle, 2007). If in face-to-face learning work/social and learning times are mutually exclusive, in online settings they can overlap and can result in devoting less quantity and quality of time to academic activities (Romero, 2011). Thus, finding a balance between quality and workload in online discussion forums, for instance, is crucial in order to avoid discouragement of students and faculty and in succeeding to deliver course objectives (Goldman, 2011).

Methodology

We used a sequential mixed method design when planning our research (Creswell, 2009). We collected quantitative data, analyzed it, and then collected and analyzed qualitative data in a second phase that was built on the results of the initial quantitative results. We finally interpreted the entire analysis by comparing and juxtaposing the data collected in both phases.

A pilot study was conducted during 2013/2014. Online feedback forms were disseminated among faculty and students, in which twenty variables were graded on a 5-point Likert scale for overall satisfaction and other variables. Open ended questions with textual responses regarding suggestions for improvement were also included.

In order to minimize nonresponse bias, students completed the feedback form of 2014/2015 in-class and 50 faculties were randomly chosen to fill in an online feedback form. Open ended questions with textual responses regarding suggestions for improvement were also included. Means, standard deviations and independent samples t-tests were calculated (SPSS, version 21). In this paper the feedback forms mentioned refer to the 2014/2015 event unless stated otherwise. We subsequently conducted a series of semi-structured interviews after the event of 2014/2015 with faculty members and with students, with the objective of elucidating their perceptions of the issue of workload. The transcripts of these interviews were analyzed qualitatively (ATLAS.TI, version 7).

Results

The response rate to the feedback forms was 28% for students and 76% for lecturers, twice as large as compared to the 2013/2014 study. The quantitative and qualitative data that we received from the feedback indicate that most students experienced a very heavy workload during the ROSE of 2014/2015. First, general student satisfaction was low (mean: 4.1 ± 1.2). The main factor was found that the majority of students (78%) felt that there was a heavy

workload during the online week. Concomitantly, this was the most frequently mentioned factor in the textual responses of students regarding recommendations for the future. Moreover, lecturers too mentioned student workload as an important drawback of the event:

“The students complained about getting too many assignments, difficult assignments, long assignments and expressed their wish to learn regularly at the college during the week of Hanukah”;

“Students complained this year as they did last year about the unacceptable workload, and noted that only a small number of lecturers were “fair” and gave an assignment that did not take too much time to complete”.

In order to understand what contributed to this sense of workload, we subsequently conducted a series of semi-structured interviews after the event of 2014/2015 with faculty members (N=5) and students (N=7) with the objective of elucidating their perceptions of the issue of workload. Analysis of the data revealed that there were 3 main themes that contributed to the sense of workload: The nature of the activities, the challenging study environment and a subjectively affected sense of workload.

The nature of the activities: The most frequently mentioned factor was that many of the activities took a long time to complete because they involved much work, or because of their cognitive complexity. Technical difficulties were also mentioned as prolonging work, for instance when they were required to collaborate in groups without using appropriate software (e.g. Google Docs). Even though students evaluated the completion time as fair (mean: 2.4 ± 1.3) the tasks themselves were difficult (mean: 4.2 ± 1.0). Also, a general sentiment was that there were too many activities. Interestingly, a significant discrepancy between the students' and faculty perception about this was observed: 53% of the students felt that the time to complete the activities was insufficient, while 84% of the responding lecturers felt that they had given sufficient time to complete the activities ($T(2,372) < 0.0001$).

The challenging study environment: One of the main challenges was an environment that was not designated for studying. The fact that other members of the family, particularly children were present made it difficult to focus on studying (mean: 2.8 ± 1.6). Students who work part-time or full-time could only complete assignments at night after a day's work. Students were expected to perform their regular duties, like spending time with their children; though no statistical difference was detected due to familial responsibilities ($T(2,336) = 0.86$). Another factor was that in many instances they found that they needed immediate assistance of the lecturers in order to complete the activity, and this was exacerbated due to the asynchronous environment.

A subjectively affected sense of workload: A recurring theme in students' textual comments of the two events showed the fact that they did not go to college during the week of Hanukkah was misinterpreted as a vacation (“A holiday should be a holiday”, or “Let us enjoy the holiday” etc.). It could be this subjectively affected the sense of workload, because the online

activities were perceived as an encroachment on their vacation. In other words any amount of academic work that is given during a vacation always seems too much, especially when children are at home, or when friends are planning an outing. Another instance of the affective factor that impacted the sense of workload was that there were students who felt that lecturers gave meaningless or perfunctory activities. These sentiments were reinforced by the students who were interviewed (N = 7).

When asked if training students to regulate their time would help alleviate the sense of heavy workload, the answers were inconclusive. Some of the interviewed students stated it would be of no help:

"I am very efficient and good at managing my time. However with the huge number of assignments and the fact that some of them were very complicated, time management skills could be of no help".

On the other hand, there were students who felt that they could benefit from such training especially as future teachers.

Discussion

The research highlighted the issue of workload in a hybrid b-learning environment termed ROSE. The sense of a heavy workload stemmed from the fact that the learning took place in a challenging environment, but also because of the number of activities, their complexity and the amount of time required to complete them. In the interviews we asked the lecturers how they addressed the issue of student workload when planning activities. The most common response was that the activities were planned according to the length of the face to face meetings, meaning that if the length of a regular lesson was 90 minutes, the planned activity was to take 90 minutes. Others said that they planned activities that were revisions of material that had been taught at the college prior to the online week, in order to avoid over-burdening the students or that they planned short and concise activities for the same reason. No lecturers mentioned taking into account the heterogeneity of the students, or referred to the reasonable amount of time a student could dedicate to academic work in the particular circumstances in which all courses go online while the learning space is shared by other members of the family. Going entirely online for a limited period as in a ROSE is not simply utilizing the LMS to put up assignments. It involves taking into account potential difficulties that can be encountered by students who do mainly coping with the activities on their own while have to balance work, study and family demands. This also means finding ways to sustain teacher presence in order to give students assistance or the impetus to excel in their performance. The implication is that faculty need guidance not only in pedagogy and technology, but also as to the nature of the specific learning environment. From the students' point of view it seems that time management skills training could possibly be of help in dealing with workload (Romero, 2011).

Although the research focused on a ROSE it has implications for e-learning and blended hybrid learning environments planned for LLL. Awareness of the issue of workload and responding to the need of having to balance work, study and family demands is a key to a successful and competitive online program in higher education.

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THE INTEGRATION OF INFORMATION LITERACY SKILLS INTO THE CURRICULUM

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Abstract

This poster summarizes the aims of the student evaluation for the Information Literacy Skills Modules that were integrated into the curriculum of several Early European History undergraduate courses in the humanities. The Skills Modules were incorporated with the view of improving students' research skills and their awareness of the rigorous principles of academic integrity. The focus for this exploratory survey is to collect information about students' perceptions of how the Skills Modules assist them to complete their written assignments and the courses. The results of the evaluation are expected to inform course design practices at AU and beyond when teachers seek to improve students' information literacy skills.

The Context

Athabasca University Undergrad Model:

- Open Education: older than 16, but no other requirements;
- Online Distance Education;
- No face-to-face experiences;
- Continuous Monthly Enrolment:
 - No cohort groups;
 - Self-paced;
- Individualized Studies;
- No deadlines for assignments;
- 6 Months Contract (paid extensions);
- 1 Tutor Per Group: groups up to 30 students;
- Study Guides, course materials, readings, etc.
- Tutors assist/guide students and mark assignments (they don't teach online).

The problem

For a long time, professors and tutors have been complaining about students that don't bring to their university studies the Information Literacy (IL) skills needed to conduct their studies satisfactorily. As in other humanities and social science courses, many students in history-type

courses tend to perform poorly because when they enrol in the courses, they have not sufficiently mastered the IL skills they need to complete assignments satisfactorily. Some are unfamiliar with the study of history at a university level, and others have undeveloped skills in research and writing. There is a strong indication that the lack of IL skills not only limits students' performance and learning but also results in academic misconduct, such as cheating and plagiarism. Instructors report they have tried various preventive and remedial measures with the view of enhancing students' performance and alleviating their frustrations—and their tutors'. None of these measures have provided a satisfactory solution.

The solution adopted – The integration of IL skills into the curriculum of history courses

To address students' lack of IL skills, IL skills modules were integrated into the curriculum of history courses to assist students in producing their assignments satisfactorily, improving their performance, and avoiding academic misconduct and plagiarism. Keeping in mind past practices, a multidisciplinary group (a librarian, an editor, and a learning designer) got together with the course coordinator to assess the context, discuss previous experiences, and determine a better and more effective solution. Then, instruction was designed, the Skills Modules were documented, and learning materials included. The Skills Modules were integrated into history courses' study guides (lessons/units) and strategically connected to the work students have to produce, the criteria they have to meet, and the expectations they have to satisfy to complete their activities and assignments. Since experience has shown that students tend to avoid non-credit materials (library tutorials, style guides, abstract written instructions, etc.), the Skills Modules were linked to credit assignments so students could not ignore them. First, automated quizzes were designed to reward students' knowledge acquired in some IL skills modules without creating extra work for tutors. Secondly, the content of the IL skills modules directly corresponded to the subjects, instructions, rubrics, and evaluation criteria for assignments that break the research paper down into stages and allow for tutors to give more focused feedback along the way. Finally, IL skills instruction was even reflected in the directions and instructions for final exams, which include essay questions.

History 215: Europe: Ancient to Early Modern

Learning Units (Course Content)	Assignments	Information Literacy Skills Students need for assignments
1 Introduction to Course	Assignment 1: Review of a Scholarly Article <ul style="list-style-type: none"> • Select from one of 3 scholarly articles about Early Middle Ages • Critically read the essay • Write a report analyzing and appraising the article following detailed instructions • Use library search tools to find at least 3 more writings by the article's author 	Skills Module 1: Library Research Skills <ul style="list-style-type: none"> •Identifying scholarly writings: books and articles •Searching AU's online library catalog •Searching AU's online journal databases •Research exercises
2 Ancient Greece		Quiz 1: Library Research <ul style="list-style-type: none"> • Prepares students for written assignment
3 Ancient Rome		Skills Module 2: Reading Scholarly articles <ul style="list-style-type: none"> •Critically reading a scholarly essay •Recognizing a scholarly essay •Analyzing its parts •Following a historical argument in a scholarly essay •Appraising essays •Prepares for Assignment 1 and 3
4 Post-Roman Europe		Skills Module 3: Chicago-Style Documentation <ul style="list-style-type: none"> •Reason for documentation •When to cite •Using the Chicago-Style •Documentation exercises
5 Early Middle Ages		Quiz 2: Documentation Quiz <ul style="list-style-type: none"> •Prepares for Research Essay (Assignments. 2 and 3)
6 High Middle Ages	Assignment 2: Essay Plan and Proposed Bibliography <ul style="list-style-type: none"> • Chose from among the assigned research paper topics • Write a 1 page essay proposal • Attach a bibliography of 6 or more scholarly books or articles • Indicate how the items were found 	Skills Module 4: Organizing a History Essay <ul style="list-style-type: none"> •Purpose of essay assignments •Features of essays •History Essay Elements (No quiz: prepare for Research Assignment 3 and final Exam)
7 Middle Ages II		Skills Module 5: Using Evidence in a History Essay When and how to <ul style="list-style-type: none"> •summarize •paraphrase •and quote
8 Late Middle Ages		Quiz 3: Using Evidence <ul style="list-style-type: none"> •Prepares for Assignment 3 (Research Essay)
9 Renaissance and Reformation	Assignment 3: A research essay in response the student's choice of topics from a list of assigned questions. <ul style="list-style-type: none"> • Must use at least 4 scholarly books and/or articles • Must use Chicago-Style documentation • Must conform to History essay norms • Must avoid plagiarism 	Skills Module 6: Academic Integrity: Avoiding Plagiarism <ul style="list-style-type: none"> •Avoiding Plagiarism •Common Questions about Plagiarism •Detecting Plagiarism •Mastering the Techniques for Giving Fair Credit
10 States and Capitalism		Quiz 4: Academic integrity <ul style="list-style-type: none"> •Prepares for Assignment 3 (Research Essay)
11 Wars of Religion		
12 Absolutism and the Limits of Early Modernity		

Figure 1. This Chart Illustrate how Information Literacy Skills are Evaluated

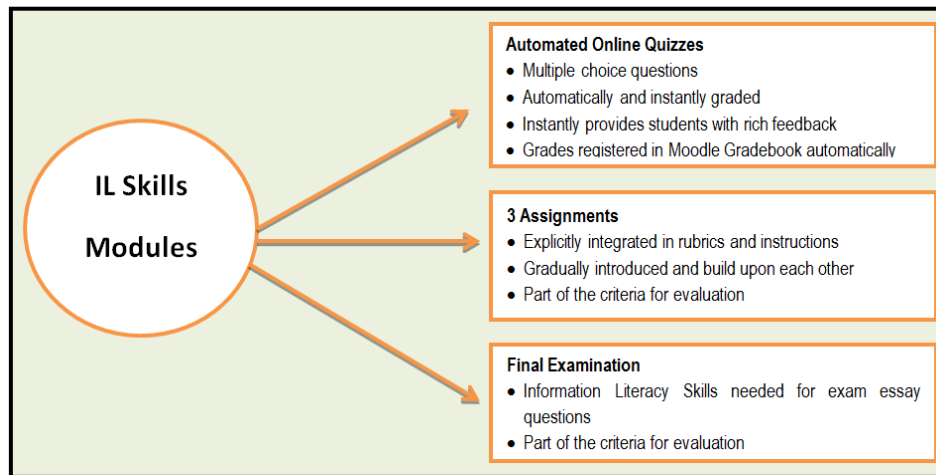


Figure 2. ILs modules are not 'optional' materials ignored by students. The Skills Modules are evaluated in three different ways.

Theoretical Framework

The Information Literacy Competency Standards for Higher Education (ACRL, 2000) framework was adopted as a framework to design and integrate into the curriculum of history courses new IL skills instruction. It became clearer that a new attempt to enhance students' performance needed IL skills instruction aligned to learning activities, assignments, and evaluations. According to the ACRL definition, "An information literate individual is able to:

- Determine the extent of information needed,
- Access the needed information effectively and efficiently,
- Evaluate information and its sources critically,
- Incorporate selected information into one's knowledge base,
- Use information effectively to accomplish a specific purpose,
- Understand the economic, legal, and social issues surrounding the use of information, and access and use information ethically and legally. (ACRL, 2000).

Methodology

Purpose and Significance of the Study

The main purpose for this evaluation is to inform course design practices at AU. In particular, it is important to learn how the Skills Modules strategy is working for students in history courses, where the strategy is already in place. It is expected the findings could inform whether the strategy is working for students in the way it was planned, if it needs to be improved, and to perhaps identify unintended benefits that may have arisen. It is expected that the findings could shed light on how to enhance the Skills Modules strategy to make the support more suitable for students who may need to enhance their IL skills.

Secondly, this evaluation is intended to inform course design practices across AU. It is intended to share and discuss the findings with the AU academic community with the view of enhancing course design practices. Other academics may find the Skills Modules suitable for their students and may want to adapt them into their own courses.

Beyond AU, we intend to present the findings in national and international conferences to discuss the Skills Modules with academics who may be also looking for solutions to address the same problem of students who lack the IL Skills.

Delimitations of the Study

This study is focused on the following undergrad, online, self-paced, individualized three-credits courses:

- History 215: Europe: Ancient to Early Modern;
- History 371: Early Medieval Europe: 400–1000 (Rev. A2);
- Humanities 312/ Classics 312/ History 312: Ancient Rome (Rev. C1);
- Humanities 313/History 313/Religious Studies 313: Early Christians (Rev. C1);
- History 383: The Vikings (Rev. C1).

The survey is expected to be in place until the end of 2015. Based on the results, the study would be extended to other courses where cooperative learning strategies have been adopted too.

The survey

A survey has been designed to collect information about students' perceptions concerning the use of the IL skills in their courses. The focus for this exploratory non-experimental survey is to gather information from students about how the IL skills modules assist them on

- improving their performance,
- completing their assignments (research essays),
- facilitating their learning, and
- completing their courses.

How the survey was integrated?

The ACRL framework, the actual Skills Modules, and the problems students have been reporting in history courses were used as a reference to integrate the evaluation research questions and the survey. Both the framework and the Skills Modules were analyzed in detail to integrate questions that summarize and make reference to the research process and activities that tutors find to cause the most trouble for students. The organization, sections, and sequence of the survey make close reference to the Skills Modules' organization and the research process students have to follow in their history courses to complete their work and assignments. This may facilitate students recalling their experience while answering the survey.

To increase the reliability of the survey, it was reviewed by the Acting Director, Library Services, the coordinator of the history courses, by other AU researchers, and by other AU learning designers who have a wide experience in educational research.

Participants

All students who complete the last assignment in the suite of courses will be invited to complete the survey on a voluntary basis. Students will complete the survey before getting their final mark.

Data collection

The survey is still available for students on the front page of their course for one year. However, during the time that students are working in the course, they are not able to see the link to access the survey; it is hidden from them until they submit their last assignment. Then an invitation to take the survey, and the corresponding link to access it automatically become visible on the course front page. Completing the survey is on a voluntary basis and completely anonymous.

Reporting the findings

The findings will be reported to the AU community with the view of enhancing course design practices. Internal dissemination of the findings will first occur among other AU SMEs (subject matter experts, or course authors), course coordinators, and designers at the institutional level. Results will be presented to the AU community through workshops and lectures to assist with course design. It is anticipated that findings and results will be also presented in national and international conferences and published in academic journals.

Evaluation Core Questions:

- To what extent do students perceive their performance improve because of the IL skills standards integrated into the curriculum of history courses?
- What are students' perceptions of the Skills Modules?
- To what extent do students think the IL skills modules inform them on using the library efficiently?
- To what extent do students consider the IL skills modules improve their understanding for completing their assignments?
- To what extent do students estimate the ISLs modules guide them to adhere to principles of intellectual integrity?

Preliminary findings (Evaluation is still in progress)

Note: the evaluation is not mature enough to make solid conclusions at this time. The survey is still in place and data continue being collected. By the time this poster is presented in the conference the data bellow will be updated.

N=14.

None	Limited	Moderate	Good	Advanced
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Before taking this course, my experience with	
a) using university libraries was	3.8
b) identifying different sources of academic information was	3.5
c) reading academic articles was	3.8
d) conducting research was	3.2
e) writing research papers was	2.8
f) documenting sources using Chicago style was	2.5

I found the Skills Modules in this course useful to enhance my skills in	
a) using the online library.	4.2
b) accessing scholarly information from the university library.	4.0
c) using journal databases to find academic articles.	4.0
d) distinguishing scholarly from non-scholarly resources.	4.0
e) recognize peer reviewed articles.	3.5
f) using advanced search principles to narrow down my search results.	3.5
g) finding full text articles using citations.	4.2
h) looking for primary source materials.	3.8
i) looking for secondary (scholarly) materials.	4.5
j) borrowing resources and materials from libraries.	4.2
k) looking for help from librarians.	4.0

Strongly Disagree	Disagree	Unsure	Agree	Strongly Agree
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The Skills Modules in this course helped me to	
a) improve my ability to study the course materials.	4.0
b) improve my understanding of assignment instruction	4.5
c) clarify my understanding of teacher's expectations for assignments.	4.2
d) improve my ability to identify different sources of information.	4.5
e) improve my skills to read scholarly articles critically.	3.8
f) enhance my understanding of research essays' organization.	4.0
g) improve my competence in conducting research.	4.2
h) improve my skills for academic writing.	4.2
i) enhance my ability to use evidence in research essays.	4.0
j) increase my proficiency to use the Chicago style to document my sources of information.	4.0
k) raise my awareness of the rigorous principles that comprise academic integrity.	4.8

The Skills Modules in this course improved my understanding to	
a) identify how scholarly articles are typically organized.	4.2
b) identify the purpose of scholarly articles.	4.2
c) identify the focus of scholarly articles.	4.2
d) recognize essays' arguments.	4.5
e) identify the source of evidence in scholarly articles.	4.5
f) distinguish primary from secondary sources of information.	4.8
g) identify authors' perspectives.	4.5
h) follow historical arguments in a scholarly essays.	4.2
i) compare information in order to evaluate accuracy and authority.	4.0
j) Identify point of view or bias.	4.0

While writing my research papers, the Skills Modules in this course facilitated my work for	
a) understanding intellectual property.	4.5
b) acknowledging the work of others adequately.	5.0
c) identifying when citations are required.	4.8
d) citing sources correctly.	4.2
e) integrating quotations properly.	4.8
f) paraphrasing sources of information.	4.8
g) formatting footnotes correctly.	4.0
h) using the Chicago style properly.	4.0
i) formatting the bibliography of my sources.	4.0

While writing my research essays, the Skills Modules in this course were useful to	
a) determine the nature and extent of the information needed to achieve a manageable focus.	4.2
b) outline my paper.	4.2
c) choose a title that reflects my topic.	4.2
d) identify the elements of a solid introduction.	4.5
e) provide a context for my discussion.	4.0
f) recall the features of an effective thesis.	4.0
g) organize paragraphs focused on a single point.	4.2
h) develop arguments supported by evidence.	4.8
i) select information that provides evidence for my topic.	4.0
j) compare information in order to evaluate accuracy and authority.	3.8
k) Identify point of view or bias.	3.5
l) synthesize information from a variety of sources.	4.0
m) write in a persuasive manner.	4.2
n) present facts accurately.	4.8
o) elaborate interpretations clearly.	4.0
p) differentiate how to use of primary and secondary sources.	4.2
q) explain the meaning and significance of a primary source.	4.8
r) summarize the interpretations of historians.	4.2
s) document my sources correctly.	4.5
t) draw conclusions based upon information gathered.	4.2

All in all, while working on this course, the Skills Modules were beneficial for me to improve my	
a) skills for searching for scholarly articles.	4.5
b) reading skills to analyse scholarly readings.	4.0
c) writing skills needed to produce my research papers.	3.8
d) skills to organize history essays.	4.2
e) skills for documenting my sources.	4.5
f) understanding of Chicago style.	4.2
g) ability to report evidence.	4.5
h) skills at avoiding plagiarism.	4.8
Overall, the Skills Modules helped me to complete my assignments successfully.	4.5
The online quizzes motivated me and rewarded my efforts to learn material in the skills modules.	4.2
The Skills Modules helped me to improve my overall performance in this course.	4.2
The research skills acquired in this course will be useful in my future university courses.	4.5

Conclusions

It is still early to reach conclusions. So far we have received 14 responses. History courses where the survey was placed have small enrolments and we expect future responses will come in slowly. Average, each course has 10-15 students per year and students have 6 months to complete their courses. The survey is intended to be open until the end of the year.

Anyway, preliminary data is showing students appreciate the Information Literacy Skills Modules that were integrated in their courses. There is a strong indication that students perceive the Skills modules as a useful help to complete their assignments. Students who come to history courses with moderate experience in conducting research find the modules are assisting them on mastering the required skills to use the library, search for the proper scholarly information, use effectively the academic journals, and recognize the peer reviewed articles required to document their papers. It is clear that students agree on the usefulness of the skills modules to understand and complete their assignments in the course and the complete the research they are expected to produce. Students report that the skills modules are definitively helping them to understand how to analyse and evaluate scholarly articles with the corresponding accuracy and authority. Figures show that students think the skills modules are helping them to master the multiple skills required to write their research papers. Overall students perceive that the Skills Modules helped them to complete assignments successfully, rewarded their efforts to learn material in course, helped them to improve their overall performance in their courses and least but not last, they perceive the could transfer the information literacy skills acquired in their courses in their future university courses.

Future Research

- Before jumping into final conclusions, we will wait until the end of 2015 to collect more data.
- We will triangulate the results of the survey with students' final grades that reveal students' performance.
- We will also interview tutors and the course coordinator to obtain their perceptions and experience on how students are using and taking advantage from the skills modules.
- At the end, we will triangulate all the information which will provide us with clearer picture and more concrete conclusions. Then, we will decide whether further work would be required in specific areas that may need further research.

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CITIZEN INVOLVEMENT VIA SMARTPHONE – A DEVELOPMENT PROJECT BY STUDENTS IN PUBLIC ADMINISTRATION

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Introduction

As part of their education in Public Administration, a group of students at University College Lillebaelt, Denmark has been working to uncover the need for developing simple apps for Smartphones, which can give elderly and disabled citizens a feeling of security in their daily lives and help them have an effective contact with the public authorities.

The development and use of Welfare Technology tools to develop the citizens' access to self-service and the contact between the public authorities and citizens are in fast development in all areas. That is why the students have to work actively and innovatively with the use and development of Welfare Technology tools which are relevant in the specific work practice they students will join upon graduation.

At the same time the students also have to be aware of the fact that developing Welfare Technology tools is not necessarily only about large and expensive IT-projects that need expert knowledge at a very high level. It also concerns small, smart new functions added to digital technology which citizens already have and feel safe using.

The project has been conducted in close cooperation with the students in Public Administration, representatives from the groups of citizens the apps are meant for and a group of students from another educational institute who has the technical skills to develop prototypes of the apps.

Project phases

The project progressed in three phases:

- The Clarification phase;
- The Development phase;
- The Testing and Selling phase.

The Clarification Phase

In the Clarification phase it was important for the students to communicate closely with the representatives from the groups of citizens the apps were meant for, because it was very important for the whole project that it was the citizens' needs and priorities that decided

which apps should be developed and in which order. Therefore, user surveys were carried out in the form of qualitative interviews and with the results of these interviews an idea-generating seminar was arranged with representatives from the groups of elderly and disabled citizens the apps were meant for.

The group of students from Public Administration and the representatives from the groups of citizens were a part of a dialogic idea-generation process in which the students had the roles of facilitators and partners in a process which was focused on the problems that elderly and disabled citizens found most significant in relation to the feeling of safety in their daily lives and in their communication with the public authorities.

The result of the process was that two concrete needs were identified, which the citizens wanted a digital solution for in the form of two apps.

One fear that influenced the feeling of safety in the daily lives of elderly and disabled citizens was the fear to fall ill, get a stroke or even die and not being found and helped for a longer period of time.

The other problem was the need to be able to give easy and speedy responses to questions from the state and municipality in relation to changes in offerings, consultations etc.

At the same time it was also very clear to see that it had to be user-friendly and well-arranged digital solutions, because they were meant to be used for groups of citizens, out of which many found the use of digital tools difficult and outside their limits.

The Development Phase

In the Development phase it was the job of the students of Public Administration to give concrete, precise and detailed descriptions of the structures and contents of the two apps. This was a great challenge and learning process to transform the wanted functionality of the two apps into a simple, visual and well-structured design without losing some of the requirements that the apps were meant to fulfil.

The descriptions of the two apps had to be conveyed to the group that was in charge of programming the specific prototypes into apps. Once again they were dealing with a concrete communication assignment as the group was dealing with various techniques in academic terms. This meant that a close, listening and active communication was needed in order to ensure that the assignment was understood – or was understandable, and why the original desired changes to the app were necessary.

Therefore, this was a learning process for both groups of students as they each became aware of new possibilities and limitations.

The results of the students' hard work were two prototypes for the wanted apps which were ready for testing.

The Testing and Selling Phase

In the Testing phase the apps were tested by the target group in order to see if any modifications were needed. At the same time the students were engaged in the Selling phase, where the aim was to find a partner who would undertake the apps for further development and commercializing.

To catch the attention of both the target groups and the potential partners, the students made a presentation video for the apps. In connection to the video it was possible for the target group to comment on the functionality of the apps, while commercially interested potential partners could see if the apps could be of interest to them.

The Output of the Project for the Students in Public Administration

The students in Public Administration have:

- Made a model for the user survey carried out in the form of qualitative interviews in relation to the goals of the project;
- Gathered data through interviews with elderly and disabled citizens;
- Participated in planning and conducting an idea-generating seminar;
- Worked up the information in the data gathered and identified the focus areas and based on this prioritized what specifically would need more work;
- Made descriptions of the design and content of the apps according to the needs and wishes from the target group;
- Handled the communication of wishes and needs to the technical development group and supervised the development of the prototype.

There have been a number of didactic considerations in relation to the project and then on the other site there have been a number of practical considerations. The didactical considerations have been on how the different phases of the project could function together with the students' lesson plans and in that regard how the project could support the students' learning targets.

In the Clarification phase the qualitative gathering of data was associated to the students' learning goals in regards to methodology in with the qualitative data survey is an independent learning goal.

The most exciting and motivating process for the students was the planning and participation in the idea-generating seminar where they were to facilitate the processes in the different work groups. They had to ensure that each group got through a step to step development from identifying different sets of problems to agreeing on two or three problems which all the members of the group found relevant to continue working with. Likewise, it was the students who presented the work of the groups in plenum.

In the Development phase the students had to choose two or three of the groups' ideas to continue with in the project. Part of this process was to scan the marked for existing apps to

ensure that they had not chosen an existing app for the project and the other part of the process was to research whether the apps which were to be worked further on needed to have commercial potential, needed to be technologically possible and not too complex for the target group to use.

In the Testing and Sales phase the students have had to get close to the final product and been responsive to the needs for modifications and the need to make a qualified presentation to potential commercial partners.

Through the work with the development of apps matching the needs articulated by the target group the students of Public Administration at University College Lillebaelt have experienced an intense, innovative and active learning process, in which they have used their theoretical knowledge and their communicative powers in concrete solution-oriented processes with equal participation from “ordinary citizens” and subject experts.

The students experience

The students experience that:

The students own experiences say that the need to transform theoretical knowledge to concrete practices in direct contact with the citizens contribute in a very positive way to their professional skills and understanding.

UISEL – UBIQUITOUS INFORMATION FOR SENIORS LIFE THROUGH MOBILE DEVICES

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Introduction

Life expectancy is growing. So there is an equally growing need to fully integrate senior citizens in the Knowledge Society where ICT tools play a crucial role. Their current exclusion, due to technological illiteracy, prevents them from fully exercising their rights but also prevents Society from benefitting from their large experience, life-wisdom and know-how. Furthermore, with the advent of mobile devices (smartphones and tablets), this problem was aggravated, as more and more information, communication and formal duties are being designed and processed for that context. Info-exclusion in adult citizens aged 50 and above relates partially to some reluctance towards change and, particularly, towards new technologies but also to the lack of attention given to the specific needs of this target group. But this is not a verdict or doesn't have to be a verdict. The difficulties that this generation experiences in the access and use of new ICT tools should not be excuse for generating inequality and increasing the risk of exclusion. It is necessary to raise awareness and to train the operators that work with senior citizens towards the benefits of using mobile devices. A different approach is needed to ensure that senior citizens know exactly how to use efficiently those devices, be it for their personal tasks or their societal requirements.

The UISEL project (under the GRUNDTVIG Lifelong Learning Programme (LLP) of the European Commission, Education and Culture DG) is conceived as a way of integrating senior citizen into the Knowledge Society, by improving their access to ICT tools and by enhancing the content and quality of training courses for teachers and staff that work with this particular target group. This is achieved by developing (i) an e-learning platform pen sources hosting the training material and (ii) two web-based training courses one addressed to trainers and caregivers and the other-one addressed to senior citizens focusing on the use of mobile devices, for instance, in regard to fiscal obligations, social security issues, emergency situations, medical monitoring, preventing isolation, and even leisure and time occupation.

The Lifelong Learning Programme (LLP) was designed to enable people, at any stage of their life, to take part in stimulating learning experiences, as well as developing education and training across Europe. LLP programme ran from 2007-2013. The activities of LLP continue under the new Erasmus+ programme from 2014-2020.

The present paper presents the novel characteristics of the project, the basic UISEL pedagogical model and the features to be demonstrated. The project started in December 2013 and is expected to end in November 2015.

UISEL E-Learning characteristics and learning game

UISEL aims at providing on-line based easy-to-use training courses addressed respectively to trainers and caregivers and to senior citizens with a basic knowledge of ICT. Although the material and the e-environment will take into account of the particular target group, the potential users will be selected among those people over 50 years old with some previous experience in the use of PC and technology.

The main output of the UISEL project is a multi-lingual Distance Learning Application (DLA) which will be designed to support teaching and learning material produced within the project in an online educational setting. It will provide a collection of tools such as those for collaboration, assessment, communication, uploading and delivery of content, return of trainees' work, tracking, collecting and organizing trainees' grades, questionnaires, tracking tools, etc.

In view of the previous analysis, Moodle is the most suitable e-learning platform for the UISEL project. A mobile version of the Moodle platform (close environment) will be customized to be used as technical support for training the trainers and a specific mobile App (open environment) will be developed for the seniors' citizens training.

Within the platform a simple set of learning games for seniors will be designed. These mini-games will have a common background topic which considering the target group could be "old times" national music and cinema. Each learning objective corresponds to a mini-game that can be chosen by the user. Each mini-game has different levels of difficulty being the level 0 an introductory tutorial. The learner can select a specific mini-game / learning objective and progress through the different difficulty levels of that game. Additionally, there is the chance to return to the home screen of the game.

UISEL training model

To facilitate self-determined tablet learning for older adults, the UISEL project has made use of sociological studies, pedagogical principles and practical knowledge of experts in the field of senior education. General conclusions from the empirical material are put into context by transferring them into a pedagogical model, which outlines the structure of the UISEL training course. This model must consider differences in the access to and participation in learning and ICT use, characteristics of learning processes of older learners and practical

experiences acquired in different cultural and organizational contexts. Two major conclusions could be drawn:

1. Firstly, the UISEL model proposes a combination of class learning and e-learning. In class learning, initial constraints towards new technologies will be relieved and social learning communities will be fostered. E-learning serves for repetition and practice in each individual's own pace and by their own preferences. Promoting "learning-to-learn"-processes, trainers are not so much teachers as facilitators, moderators, motivators and confidence-builders on an equal footing.
2. Secondly, UISEL operates along a basic structure of contents and modules. This framework aims to be concrete enough to offer a structure to both trainers and older learners, but should also be flexible enough to leave enough participative space for co-creation of the learning process. The basic framework comprises one basic module and several thematic modules – e-interaction, e-information/e-government, e-entertainment, e-health, and e-banking – which can be selected either by the trainer or based on the participants' interests and needs. Each module comprises 16 hours of teaching and learning: eight hours will take place in class and eight hours by autonomous self-learning and/or e-learning. Material will be elaborated by each partner organization following the same structure and focusing on the development of simple and clear presentation supported by video-tutorial and APP dedicated to the different treated topics.

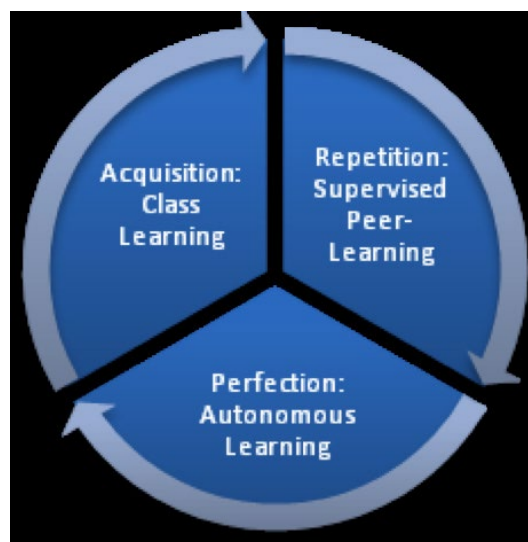


Figure 1.

UISEL at the EDEN annual conference 2015

UISEL' s goal, as foresaid, is to enhance the quality of life and facilitate the integration to the Knowledge society of senior citizens, by improving their access to ICT tools and by enhancing the content and quality of training courses for teachers and staff that work with this particular target group. It aims to help such vulnerable groups to avoid isolation and social exclusion and to benefit from ICT, by providing distance learning in a new educational way: oriented learning and training. This as a result adapts to the *Expanded learning scenarios* conference theme “Tools and resources for learning through mobile” and the “New generation of methodologies for older generation of people”. In particular during the conference some training material will be illustrated.

ICT FOR LIFELONG LEARNING IN ARMENIA AND GEORGIA

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Introduction

The ARMAZEG – Developing tools for lifelong learning in Transcaucasus region: e-Learning project (financed by the European Commission within the TEMPUS program) aims to stimulate educational reform in Armenian and Georgian universities by developing lifelong learning methodologies, implementation strategy, teacher training and setting up of e-learning centres.

The project involves twelve partners from Europe and Transcaucasia with a clear vision to establish new links in the educational sphere between the two regions. With the assistance of four European partners ARMAZEG's Armenian and Georgian institutions import and adapt e-Learning practices in their educational agenda to realise a flexible organisation of higher and adult education locally. A thorough needs analysis accompanied by study visits to the state of the art European universities helps the Transcaucasian partners improve learning by supporting student-centred methodologies, research-based higher education and enabling the internationalisation of their higher education services.

The first outcome of the project is a state-of-the-art report about the assessment of the current situation with regard to the level of development and the use of tools of e-learning and lifelong learning in Armenia and Georgia, with detailed analyses of e-learning readiness on the institutional level of the involved universities. The present paper is an overview of the full report, available to download on the project's website (<http://www.armazeg.com/en>) as well as the strategic goals that the partnership has set to try to reach while realising the concrete project outputs.

Legislation about e-learning

In Armenia and Georgia there is currently a lack of a clear legislation regarding e-learning and lifelong learning. As a result it is not possible to accredit an exclusively online curriculum and provision of academic courses via e-learning is faced with many challenges in certification that institutions are not willing to face. Accreditation for blended curricula is feasible. Provision of courses for personal development and continuous training is also less difficult.

In Georgia the National Board of Accreditation is currently being formed. The ongoing establishment of this new official body provides the opportunity to put the recognition and accreditation of e-learning on the agenda.

In Armenia a legislative framework for higher and adult education is currently under development, but there is no centralized system of governance. Another consequence of the lack of legislation and centralized organization is that private and public organizations and institutions develop their own strategies and initiatives regarding e-learning and lifelong learning however without structural funding, the implementation of e-learning happens mainly based on individual initiatives and projects. As a consequence implementation remains fragmented, isolated and runs a high risk of being terminated when project funding ends.

The high number of current e-learning projects and initiatives nevertheless indicates that the interest in the possibilities of e-learning is high, in Armenia as well as in Georgia, and the results of successful e-learning projects and initiatives can serve as a lever for further and more general implementation of e-learning.

E-learning networks

Both in Armenia and Georgia, there are national e-learning networks with the aims of dissemination, teacher training, support and exchange of experience regarding e-learning.

In Georgia several higher educational and research institutions established the National E-Learning Network in 2012. The main aim of the network is the popularization of e-learning at the national level. The Network was established within the frame of the project Capacity Building and Infrastructure Development for e-Learning in Caucasus, conducted by the international organization GIZ - German Society for International Development.

The Armenian E-learning Network (ArmeLNet) and E-learning centre was founded in 2010. The mission of the network is the promotion of e-learning to the Armenian educational landscape. It supports its member organizations in the development and deployment of e-learning activities. The network established a National Learning Management System, a Moodle based platform used mainly for sharing e-learning resources.

ArmeLNet also created an assessment tool for the quality assurance of e-learning courses and modules called the Caucasus e-Learning Quality Assessment. In 2010 Tbilisi, Georgia, was hosting the First e-Learning Conference in the Caucasus region. Within the frame of the conference there was a workshop devoted to the Quality Assurance of e-Learning courses and infrastructure. Participants from the three Caucasus countries Armenia, Azerbaijan and Georgia took part in the workshop. The Caucasus e-Learning Quality Assurance Check-list was a result of the work in this workshop and it is based on the experience of the researchers and practitioners in the field of e-Learning in Caucasus. The document is widely used in the process of assessment and evaluation of e-Learning courses by the members of National e-Learning Networks of the participated countries

Both national e-learning networks are part of the Regional e-Learning Network that includes Armenia, Azerbaijan and Georgia. It was established within the frame of a German Federal Ministry for Economic Cooperation and Development funded project called Capacity Building and Human Resource Development in Caucasus. Contribution from these networks and from GIZ involves consultancy, statistical data as well as content and software exchange.

Technology enhanced learning in Georgia

A lifelong learning system was very well developed in the Soviet time. But the educational system as a whole and the LLL system in particular, were badly affected by the severe economic and political crises, occurring after the crash of the Soviet Union. At the moment a new concept of LLL is developing and e-learning is regarded by the professional community as an effective tool to create and distribute lifelong learning solutions.

Implementation of TEL in the learning process at the different levels of education is very intensive in Georgia nowadays. First successful attempts of ICT related LLL solutions, have been already implemented in the Georgian educational environment. However the main characteristic of ICT enhanced education remains that e-learning is used blended with the traditional learning.

The Netbooks for Primary Schools project supported by the Georgian government was successfully implemented in the primary schools at national level. Within the frame of the project all pupils in the primary schools have been equipped with the netbooks, designed to enhance the face-to-face learning process and give them individual working space to master new material explained by a teacher at class.

The Virtual laboratory project targeted the secondary schools, aimed at overcoming the lack of physical laboratories in natural sciences. For this, virtual laboratories were purchased for a number of schools in Georgia, especially for the schools in rural regions.

E-Learning tools and methodology has being widely implemented in the Higher Education System in Georgia as well. At the moment, this approach to learning is mainly used in parallel with the traditional, F2F learning process, enhancing it with the flexibility and convenience. Those students, who are keen in technology and feel very comfortable in the virtual environment, would like to take advantage of technology-enhanced education fully. On the other hand, lecturers and professors also realize that by implemented modern ICT in educational process and using up-to-date technology they are creating learning environment, very attractive and familiar to the learners. This is so called “Win-Win” position, where both participants of the learning process - teacher and student - could benefit from the educational process fully.

Technology enhanced learning in Armenia

Lifelong learning and e-learning are not new attitudes in Armenia. The Law of the Republic of Armenia on “Higher and Postgraduate Professional Education” was adopted in 2004. This law regulates the system of higher and postgraduate professional education in the Republic of Armenia making certain reflections on lifelong education, as well as on the growth of the level of professional qualification of the specialists and their training.

As a centralized system of governance in the field of adult education and learning is missing it is taking place decentralized. It is organized and implemented by the state as well as private organizations and NGOs, like the Lifelong Learning League (www.edu.am), which is an umbrella organisation for 12 non-governmental organizations experienced in education and training in Armenia. The overarching goal of the League is to support the formation of lifelong learning culture in the country by means of developing a coherent LLL system focused on employability/adaptability, personal fulfilment, active citizenship and social inclusion.

Starting from 2003, after the comprehensive arrangements of the “Adult Education Days in Armenia” organized by the dvv international (Institute for International Cooperation of the German Adult Education Association), different stakeholders have started the process of cooperation in the field of Adult Education and Learning. Within the same year the Adult Education and Lifelong Learning Association was created, which assumed an important role in the matters of development of Adult Education and Learning by organising a series of seminars, conferences, trainings, discussions, fares, etc.

The ARMAZEG vision and strategic goals

The ARMAZEG vision is of a future in which higher education institutions in Armenia and Georgia will use technology to enhance education for students and lifelong learners. More specifically e-learning will serve as an important tool

- to ensure a flexible organization of and easy access to learning;
- to improve the learning process by supporting activating teaching methods;
- to support research-based education;
- to support the internationalization of higher education;
- to facilitate the process of lifelong learning in Armenia and Georgia.

The following strategic goals (SG) are defined as necessities to be achieved in order for the above vision to be realized:

SG 1: To have an established policy on e-learning on institutional and national level

In order to have an established policy on e-learning it has to be incorporated into the education legislation. Starting point would be to urge universities to explicitly integrate their existing e-learning practices into their curricula. The main emphasis in these policies can be on the sustainability of e-learning which will become an integrated part of education. The main

achievements will be legislation, recognition; accreditation for online-learning; centralized governance, funding based on central policies.

SG 2: To have implemented strategies on institutional and national level concerning the provision of Life Long Learning (LLL) through e-learning methodologies

To realise this LLL has to provide accessibility of education students with disabilities, minority students, students from a lower socio-economic background, students from rural areas or geographically isolated areas, including educational services for a large Armenian and Georgian Diaspora.

SG 3: To have established and shared pedagogical models for e-learning

This goal will be realized if there will be a shared understanding and use of modern pedagogical models and if certified courses and modules are being developed suitable for e-learning and in accordance to these models. E-learning resources are implemented to enhance the quality of teaching and learning in accordance to European standards.

SG 4: To have a shared quality framework for e-learning

It is very important to form a joint framework for e-learning that will help to develop procedures in order to assure the quality e-learning using existing developments like the Open ECB Check and Caucasus e-Learning Quality checklist as well as the European good-practices. The framework would also facilitate the process of self-assessment of e-learning in Armenian and Georgian partner organizations.

SG 5: To have staff qualified to implement e-learning on a technical and pedagogical level

There are two pillars of the future sustainable success for e-learning in each organization: appropriate infrastructure and qualified – accredited - staff (technicians and lecturers as well). To reach the above strategic goal, provision of sustainable capacity building on institutional level is a necessity, as well high quality in-service training and training material for teachers (preferably via e-learning to “teach as you preach”).

SG 6: To have the right infrastructure to enable optimal use of e-learning

It is not possible to provide high qualified and modern education without the necessary infrastructure: dedicated space and equipment including software; trained staff; structured computer networks, appropriate speed and bandwidth; mobile communication opportunities etc.

SG 7: To provide research-based education with the help of ICT-tools

Research-based education can become a very effective methodology to support learning processing particular conditions. ICT-tools provide a certain level of independence and

flexibility in the educational process. They also enable a wide cooperation between students, teachers and researchers (including guest lecturers and alumni).

SG 8: To implement the principles of virtual mobility on the level of courses and curriculums

Virtual mobility, or ICT supported cross-border interaction, enables students to have international and intercultural experiences without having to travel physically. VM will be implemented on the level of courses and curriculums to support internationalization at home strategies. VM will be recognized as an integral part of the institution's internationalization strategy. VM will also contribute to a solution for the problem of native education for Armenian and Georgian Diaspora.

SG 9: To have strong national and transnational collaboration

Sustainability is the most important strategic issue for education. National and transnational collaboration is one of the best ways for solving this problem. The organizations aiming at sustainability can form the base for such kind of collaboration. From this aspect cooperation is important to generate joint National Learning Management Systems in Georgia and Armenia which can be the best environment for national and regional cooperation.

The ARMAZEG partnership defined their operational goals in relation to the above strategic goals with keen attention to the risk factors:

1. readiness for consensus and changes within university authorities (rectors & vice rectors, members of senates, deans and faculty/department managements); legal framework and support of Ministries; (non)-existence of standards on e-learning on a national level in Armenia and Georgia
2. commitment of university and faculties management to support the e-learning initiative;
3. commitment of academic staff to implement e-learning, readiness of academic staff for changes in teaching process.

At present the project is halfway through its funding period.

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EDUCATIONAL APPS FOR HIGH SCHOOL EDUCATION AT NATIONAL AUTONOMOUS UNIVERSITY OF MEXICO

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Introduction

The incursion of apps into the educational field is in its initial stages. There is a long way to go, which is why it is necessary to develop and use innovative educational resources that effectively support the students' learning and teaching processes. Under such premise, National Autonomous University of Mexico (UNAM) has developed an integral formation project for high school students through a number of apps that support learning within different knowledge areas such as Mathematics, History, Geography and Spanish. This paper will present a theoretical framework for educational apps, their use and a short account of this experience.

Theoretical Framework

Apps

The accelerated growth of the smartphone market has favoured the increasing availability of apps (Banga & Weinhold, 2014). A mobile app is software which has been designed to run on smartphones, tablets and other mobile devices. Apps are generally available in cloud stores such as Apple's App Store, Google Play, or Windows Phone Store. Some apps are available for free and others need to be purchased (IPC, 2014).

Apps may seem like a novelty, but they are neither new nor recent in the field of computer sciences. However, their ubiquity, usability and usefulness in everyday activities have placed them in a prominent position among smartphone users. Villalonga and Marta-Lazo (2015) stress that fact when they point out that "mobile apps facilitate the flexibility and multiplicity of functions of mobile devices. The success of an app lies in its simplicity, usability, and accessibility, in addition to the appeal of its design, the diversity of its topics, its availability and its capacity to adapt to the needs of the user."

Some important aspects to take into account for developing an app are the user needs that the app will address, the cost it will have for the user, the features and basic functions it will perform, as well as the complexity, time requirements and expenses of its development (Yarmosh, 2011).

On the other hand, the essential features for an app to be successful are the following: that users be able to operate it with ease, that its features meet the needs and requirements, that it tend a need which has not been previously covered by any other app, that it be based on an adequate study of needs, that it be compatible with different platforms and devices, and that it meet the user requirements so that users keep using it for a long time (APPLCONIC, 2014).

Apps in Mexico

According to Mexico's National Institute of Geography and Statistics (INEGI¹), the country has over 122 million habitants. A 2013 study about mobile devices uses and habits² points out that 84% of Mexicans are users of mobile communications, which adds up to 94 million users. The study also says that 65% of those users – about 61 million people – surf the internet on their mobile devices. On the other hand, website *Mexico The App Date*³ states that 60,000 apps are downloaded in Mexico every day, that 90% of them are used daily, and that only 115,600 of the total amount of app downloads in Mexico up to April 2014 fall into to the Education category, making it one of the least popular categories around. In a different report titled “Apps in Mexico”, it is estimated that from 2012 to 2017 the growth rate of mobile app users will increase 29.8% annually.

Educational apps

According to Prensky (2011), the following characteristics favour the inclusion of apps in education:

- Apps can be designed for very specific purposes.
- Apps can cover complete curricula; each piece can be downloaded when it is needed.
- Apps are becoming increasingly intuitive, with interfaces that can be controlled by touch or voice.
- Apps can integrate all the other features available in mobile devices such as cameras, voice recorders, phone calls, internet connection, GPS, Twitter, Skype, etc.
- Apps can incorporate cloud capacities: text to voice, voice to text, speech recognition, data storage, computation capacities, etc.
- Apps can do everything computers and books do, incorporating all the capabilities of the aforementioned tools and more.
- Apps can be carried inside students' pockets (if we talk about Smartphones, which is where apps are more common) (Prensky, 2011).

In spite of the fact that educational apps are still in their initial stage, their great potential for teaching is evident, making Smartphones powerful tools for learning both inside and outside of school (Prensky, 2011).

It is most important to take into account that if already-existing apps cannot meet our students needs, we need to develop apps especially for them. Doing so is good for the future of

¹ <http://www.inegi.org.mx>

² <http://es.slideshare.net/iabmexico/tipos-usuarios-mobile-2014>

³ <http://mexico.theappdate.com/wp-content/uploads/2014/04/infografia-apps-mexico-2014.pdf>

young students and provides them with the abilities necessary to enter the professional market (Prensky, 2011). Therefore, the potential of apps depends on designing the activities in such a way that their features are exploited to meet unique purposes (Beach & O'Brien, 2015).

Educational apps at UNAM

The project

According to its website, the “*Tecnologías en el Aula*” project (“Technology in the classroom”, in English) was created to “promote learning with the help of technological tools for the development of digital competences that contribute to the improvement of the students’ performance, according to the formative goals of UNAM’s secondary education,”⁴. Based on these guidelines a pilot project was developed for the use of tablets in formal, face-to-face education at secondary level in two schools of the Escuela Nacional Preparatoria of UNAM: ENP 6 and ENP 7. Several departments of UNAM participated in the project: *Coordinación de Innovación y Desarrollo* (CID), *Dirección General de la Escuela Nacional Preparatoria* (DGENP), *Instituto de Investigaciones sobre la Universidad y la Educación* (IISUE), *Dirección General de Cómputo y de Tecnologías de Información y Comunicación* (DGTIC), *Coordinación de Universidad Abierta y Educación a Distancia* (CUAED) and *Dirección General de Comunicación Social* (DGCS).

The implementation of the Project consisted in three groups of activities:

1. Teacher training to facilitate the incorporation of technology inside the classroom.
2. **Compiling and developing educational applications for mobile devices in different operating systems, suited to the curriculum of Escuela Nacional Preparatoria.**
3. Improvement and expansion of computer and wireless infrastructure.

The paper will now focus on the second of those activities.

Compiling and developing educational applications for mobile devices

DGTIC and CUAED partook of this activity, establishing guidelines for app development and a methodology, both of which are presented next.

Guidelines

The guidelines for app development deal with two main aspects. The first is related to the “Guide for identity, style and human interface”, which defined the characteristics presented in the following table.

⁴ http://www.enelaula.unam.mx/temas_menu/elproyecto.html

Table 1:

Specifications	Elements
Operating System	iOS, Android
App Screen Orientation	Horizontal, vertical
Basic elements	Icon Welcome screen Notification bar (network, time, battery indicator) Title area (the name of the app and UNAM's official seal) Menu button Instruction button Bottom bar (Home, Restart, Topic information, About, Credits, Share button)
Overall design elements	Button size Typography Contrast

The second aspect is represented by the instructional script developed by teachers and pedagogical consultants, which is later translated into an app by graphic designers and visual communicators. The instructional script features the following elements: identification data (with the App title, Author, Pedagogical consultant, Course from the curriculum, Description, Graphic designer, Date, Format, Resource identifier, Language, Hours required, Key words, and Copyright,) introduction, graphic instructions, activities, summary and sources.

Methodology

Apps were developed according to the development methodology established by CUAED. The process is illustrated in the following figure.

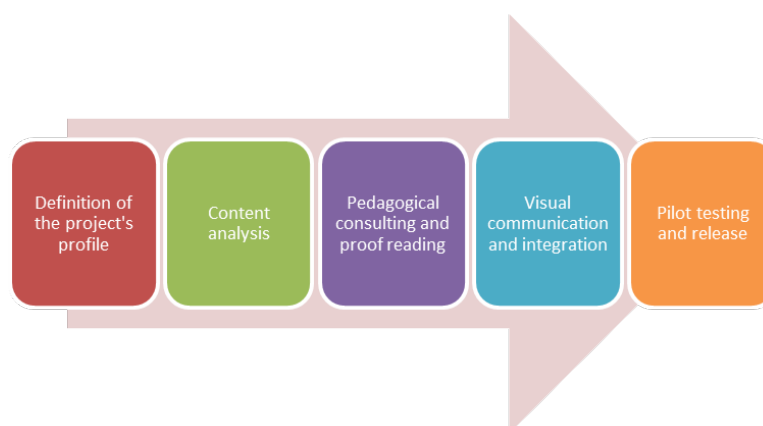


Figure 1. Development methodology

In the first stage, two aspects are defined. First, the administrative issues where the general project information, participants and time table are defined. The other one deals with form: the educational model which will support the project is defined, as well as the navigation diagram (navigation levels). These are the basis for the instructional script, which is the main instrument in the methodology.

The Content analysis stage is where content experts define, search and develop the content that will be featured in the app.

The Pedagogical consulting and proof reading stage encompasses two important activities. The first one is to develop learning and assessment activities as well as the general organization of the project. The second one focuses on the revision of spelling and uniformity of the writing in the instructional script.

In the Visual communication and integration stage, the templates for the presentation of content and activities are defined, the images are drawn, custom resources are developed and, at last, content and activities are integrated.

Finally, in the Pilot testing and release stage, the app is evaluated and the testing provides feedback allowing detecting problems that need to be solved to improve the app before its release.

Apps developed and released

The twenty-six educational apps developed by CUAED are available at apps.unam.mx. The following table shows the categories in which they have been organized.

Table 2:

Mathematics	Spanish	Geography
First degree inequality in a variable	Essays as argumentative texts	Tectonic Plates
Rationalization	The verb	Erosion
Systems of Inequality	Subordinate sentences as adverbs	Geological periods
Operations with groups	Subordinate sentences as adjectives	Seawater movements
Products and factorization	Subordinate sentences as nouns	Lakes and rivers in Mexico
Division of monomials and binomials	Discourse connectives in writing	The structure of the Earth
Scientific notation and logarithms	The sentence and the active voice	Uses of Geography
Numbering systems – Operations with different basis	Text and paragraph	Earth surface representations
	Passive voice	Geography's field of study

To access the apps it is necessary to be part of UNAM, either as a teacher or a student, and to register for installation in mobile devices. The following figure shows a screen capture of some of them.



Figure 2. Apps

Conclusions

The experience has allowed the consolidation of a group of specialists who have been enriching a development methodology focused on the creation of digital educational resources in different formats.

On the other hand this kind of resources allows UNAM to compile and promote the knowledge produced by its academics.

Even though the goal when providing youth with learning experiences through apps was to support their learning processes, it is also possible for them to acquire digital competences, which are elementary and necessary in the context of professional and personal development in the age of the knowledge society.

On the other hand, UNAM carries forward its purpose of “forming professionals who are useful to society” by developing new ways of teaching and learning through currently available technologies. In addition, it will be important to measure the impact of the apps during a second phase in order to update and improve them.

Once the apps have been consolidated, it will be necessary to expand their availability in such a way as to become learning tools for the general public throughout their lives.

Human resources are a fundamental part of UNAM – particularly for CUAED which has specialized in the use of technology in education – this experience has allowed the formation of specialized groups capable of transmitting their knowledge to other educational institutions to further develop apps from which society may profit at any educational level, both within Mexico and internationally.

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RESEARCH AND ROLE IN EDUCATIONAL POLICIES AND PRACTICES IN DISTANCE EDUCATION AND ELEARNING IN PORTUGAL

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Abstract

The last aim of this study is to outline scenarios of future in distance education and e-learning, in higher education, looking at Portugal's condition within the European context. Accordingly, we've decided to investigate the role of research results in educational policies and practices, since they could ground decisions in the present and become a framework for the future.

Three stages of investigation have been defined. The first step was to map the state of the art of research on distance education and e-learning, in higher education, but go beyond, in a second moment, summoning discussion and reflection of the protagonists in the process. Thirdly, the prospects of national and European perspectives of specialists in this field will be faced up.

Still in the research process, we present here the global design of the study and preliminary and partial results of phase 1 research.

Introduction

In the last decade, institutions of higher education in Portugal, similarly to what has happened around the world, have embodied e-learning practices in such a way that, today, all of them use some kind of virtual learning environments. However, the way the use of these environments becomes a reality in pedagogical practices, the institutional strategies that underlie these practices and the success factors associated with it is still not clear.

Research in this area has mainly focused on two categories, case studies and research on a large scale (e.g. Aczel et al., 2006). Proliferate case studies, exploratory and descriptive, but no systematic research that allows a global or macro vision in order to provide evaluation of its educational value and added value in terms of cost-benefit. The same for large-scale studies, sponsored by international and/or business programs that have not allowed a clear understanding of educational effectiveness factors. It seems to be difficult to articulate reliable quantitative inquiries that allow valid comparisons with qualitative e-learning strategies.

Moreover, the quality of the studies used in systematic literature reviews and meta-analyses in this area seems to be insufficient to provide valid data. Still, as stated by Albuquerque (2007), much of this research is carried out individually under academic work to obtain degree or career, without being connected *to lines or schedules of more robust research* (p.10). The influence of such studies is found primarily when they emerged without consistent consequences in more global contexts. The fundamental question for research in this area does not seem to be mere review of best practices, but the identification of innovative strategies and success factors that underpin these practices.

Theoretical background

The processes of implementation of digital technologies in education have proved more complex than initially expected and the advantages of their use does not appear to be clearly evident and substantiated (Anderson & Dron, 2011; Guri-Rosenblit & Gros, 2011). The expectations created in the 90s due to the mediated learning technologies, particularly those who advocated a radical transformation of the teaching-learning process and that the mastery and control of this process would be from teachers to students, do not seem to have been fully realized. On the other hand, this scientific field still indicates immaturity, which is expressed, for example, in the terminological confusion that could result, considering it is a relatively new field and therefore has to deal with imprecisions (e.g. Sangrà, Vlachopoulos, Cabrera & Bravo, 2011).

Despite attempts to clearly define the concepts in question (ibid.), it seems impossible at this moment to find a consensual definition. One of the salient factors that contributes to this fact is the emergence of new terms as new technologies and tools are developed. Another one is the fuzzy distinction between the concepts of distance education and e-learning, used as synonyms quite frequently. The terminological confusion has an impact on research results, and since the distance is not a criterion to define e-learning, it seems important that, in research situation, the context in which it occurs is clearly identified (distance education or teaching face).

Regarding the research, meta-analysis (e.g. Means et al., 2009) reports weaknesses such as insufficient sample size or possible bias of the results by assuming the dual role of researcher and intervening in the situation without appropriate methodology. To these weaknesses we can add up difficulties in conducting longitudinal studies on the impact of technology or, at least, take into account periods of extended time or, yet, to leave the conventional structure to test the impact of a specific application/tool.

Bates (2005) states that, although the amount of research in this field is considerable, several studies point to weaknesses in its quality. The fact that it is mostly based on a single case, descriptive and qualitative and cannot contribute to a solid theoretical framework, makes it difficult or impossible to generalize. But, despite these limitations, a set of results has begun to emerge, which have identified consistent guidelines for the establishment of distance education practices and successful e-learning. The question that deserves mention here is that,

often, institutional decision makers are unaware of these data, which may help to explain why so many initiatives in this area fail or do not have the desired and/or expected results.

Looking at the quality and consistency of studies in this field, Guri-Rosenblit and Gros (2011) present four priority research areas at present: a) administration and management, b) technological infrastructures, c) pedagogy and d) social context. These areas should be crossed with three levels: micro, meso and macro, advocating the idea that e-learning is a complex and multidimensional scientific field, and that any changes in one area or level necessarily affect others. Hence the need for a conceptual model representing this complexity and guide research.

It seems important then to emphasize two key ideas: the difficulty in finding a strategic vision, at the macro level (indeed, the most neglected research level), to guide national policies in this area and the difficulty in having a clear view of the cost-benefits of implementing technology in education. In this case, the implementation of technology must prove to be a clear added value and not simply reflect the fact that they are “innovative” or “trendy”.

At this time, at least two international trends of distance education and e-learning are noteworthy, namely the emergence and consolidation of collaborative learning processes in network and widespread use of mixed models, b-learning in traditional higher education institutions (Hasan & Laaser, 2010). Can these trends be observed in the Portuguese higher education? At this time, all institutions of higher education have some model of virtual learning environment. However, institutional strategies that underlie these practices and its expansion do not seem clear, nor are the success factors taken into consideration. Research in this area is usually presented in two categories: case studies and questionnaire surveys (Aczel et al., 2006), which seems insufficient for the above reasons.

Higher education is, by its nature, a place of innovation in relation to knowledge and its construction and dissemination. Scientific development, in this case in education and technology, has produced emerging needs analysis, evaluation and reflection of the scientific production, making them important tasks among the academic community. This demonstrated the need to better understand the state of the art research on distance education and e-learning, higher education in Portugal, and see forward, anticipating different scenarios.

Methodology

The objectives of the study are:

- Outline the state of the art research on distance education and e-learning in higher education in Portugal in the last decade.
- Identify perspectives/perceptions of the academic community in the face of research in this field and their impact on innovation and policies for distance education and e-learning in higher education.

- Confront the national outlook on future scenarios in this area with European perspectives.
- Contribute to the history of distance education and e-learning in higher education in Portugal.

Empirical research involves three stages of collection and analysis of data. Initially we will confront the extracted data on the state of the art research on distance education and e-learning in higher education in Portugal, through a methodology of meta-analysis, with the perspective of the scientific community in this domain, designing scenarios of future through the methodology of discussion groups. These perspectives will be contrasted with the outlook of European experts in the field, through the methodology of Delphi study.

Phase 1 – Ten years period – Documentary analysis of scientific production in the field

This phase involves an unconventional meta-analysis, a “qualitative meta-analysis”, from the perspective of Cardoso (e.g. Cardoso, 2007; 2008; 2012; Cardoso, Alarcão & Celorico, 2010; 2013). The meta-analysis, a set of techniques for quantitative analysis, has been used more frequently in areas such as health sciences, systematic reviews of literature, to evaluate sets of independent studies with a quantitative character. Studies of systematic review using the meta-analysis are often called meta-analysis. Following the objectives of the investigation, such a study will be used but with a qualitative approach in what it is intended to embrace, record and analyze all types of studies produced within a given time frame, within a comprehensive theme, subjecting the data to content analysis and descriptive statistical procedures.

At this stage, the documents presenting research in the study are identified. The contents will be handled through the categories defined in a process that will group and reconfigure. Thus, the following actions will be performed: a) identification and collection of documents to be analyzed; b) content analysis thereof; c) systemization of information into the database, with consequent d) statistical analysis, identifying trends with respect to criteria such as subject, and type of research methodology, techniques/tools of data collection, sample techniques/tools for analyzing data and conclusions.

The corpus of analysis consists of all documents that report research conducted in distance education and e-learning in higher education, produced in Portugal, in a period of ten years, from 2004 to 2013, inclusive, under the form of master dissertations and PhD theses, publications in journals, conference proceedings/seminars, books and chapters’ books.

Phase 2 – Analysis of the prospects of the academic community about scientific production in this field and identifying future scenarios through discussion groups

The discussion group is a technique for collecting qualitative data that privileges the perspectives and perceptions of social actors. It implies a collective dialogue on certain issues above, resulting in the production of a speech from which the negotiated and reconstructed subjective representations of the participants will emerge (e.g. Santos, 2008; Pérez-Sánchez & Víquez-Calderón, 2010).

The sample consists of three groups of university researchers with a maximum of twelve elements. The criteria for selecting the sample are: a) researchers in higher education; b) heterogeneity in terms of gender, age, academic education and institution; c) willingness to participate in the study. Content analysis of the transcript of the speech produced in discussion groups through appropriate software will be held.

Phase 3 – Analysis of the prospects of European experts about future scenarios in Portugal and in Europe through the methodology Delphi study

The Delphi method involves the use of questionnaires, which are applied at different times, two or more times, allowing participants to reassess their responses according to the data compiled in each round of responses. It is a flexible methodology, which involves a structured questionnaire, iteration and feedback of participants' responses and their anonymous nature (e.g. Okoli & Pawlowski, 2004; Hsu & Sandford, 2007).

The sample consists of ten academic researchers from EU countries with recognized academic work in the field of distance education and e-learning. The criteria for selecting the sample are the same as phase sample 2. The list of participants in phase 2 and 3 will be built by the inquiry, at least three researchers.

Presentation of preliminary findings of phase 1

Proceedings

This phase began with the identification and registration of documents which present research on distance education and e-learning in higher education in the period considered by search descriptors such as “distance education”, “e-learning”, “higher education” in Scientific Open Access Repository of Portugal (RCAAP). At some point, these descriptors were expanded, combined or substituted, for example, “online”, “b-learning”, “distance learning” or “e-learning” by “e-learning”.

The documents were registered in a sheet built and completed separately each institution of higher education in which the document was published. This will allow an analysis of scientific literature per establishment.

The total number of documents identified herein presented data from a sample comprising only dissertations and doctoral thesis after academic evidence. In this sample, 97 documents (cf. Table 1) were identified.

Subsequently, a database with specific information for each document was built / devised, allowing the extraction of information for further discussion and analysis basis. This base is organized into five key parameters: theme, objectives of the study, theoretical frameworks, methodologies and research contributions.

Following this survey and registration, and from a first analysis which included i) title; ii) keywords; iii) summary for each document, seven categories of codes (See Table 2) on the subjects addressed in the studies that comprise the corpus of analysis were identified. This is still a rough approach that requires further analysis, since not all the aforementioned parameters have yet been extracted.

Results

Table 1 shows the distribution of studies by type and year of publication. At first sight, we can observe a progressive increase, although not constant, in the number of studies in this area, with a substantial decrease in 2010, a fact that requires investigation. Data for the year 2013 are still provisional. In Chart 1, which is presented below, we can see this trend in graphic terms.

Table 1: Distribution of studies by type and year of publication

Years	Master Dissertation	PHD Thesis	Total
2004	3	1	4
2005	3	2	5
2006	5	2	7
2007	4	4	8
2008	8	3	11
2009	12	2	14
2010	3	3	6
2011	10	8	18
2012	9	4	13
2013	3	5	8
Total	61	36	97

Research and Role in Educational Policies and Practices in Distance Education and elearning in Portugal

Angelina Costa, Lina Morgado

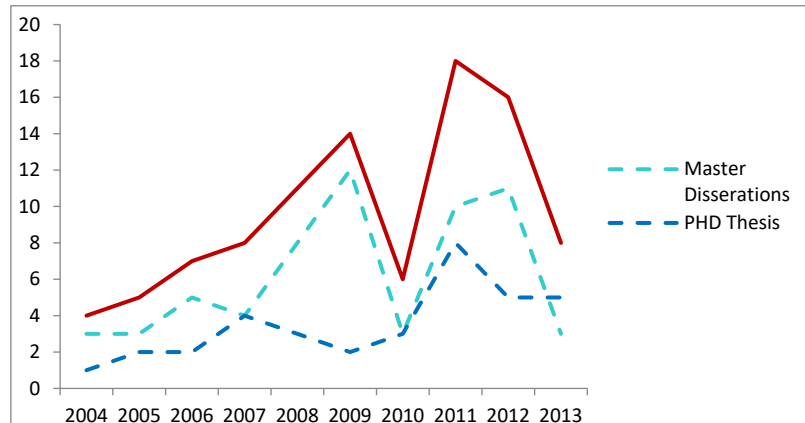


Chart 1. Distribution of studies by type and year of publication

The categories extracted from the investigated documents are presented in Table 2. Each of these is properly defined and described.

Table 2: Distribution of studies by type and year of publication

Subject	Master Dissertation	PHD Thesis	Total
Pedagogical models	6	5	11
Learning contexts	11	11	22
Technologies/tools/resources	19	11	30
Communication processes/interaction	9	3	12
Perceptions/attitudes/expectations	8	1	9
Evaluation	3	1	4
Teacher training/e-tutors	5	4	9

The category “pedagogical models” includes, for example, studies on proposals and models of e-learning or b-learning in particular higher education institution. The “learning contexts” category encompasses studies, for example, on supporting the teaching-learning or virtual learning communities in process platforms. In the “technologies/tools/resources” category studies have circumscribed experiments, for example, the use of videogames in a specific course is considered. In the “communication processes/interaction” the studies that analyzed/evaluated, for example, interaction strategies in the context of a specific course or course unit are included. The “perceptions/attitudes/expectations” category includes studies that sought to, for example, examine levels of satisfaction in a given course. The “assessment” category only adds studies of e-assessment, which means it doesn’t include studies on evaluating models, contexts or tools/technologies. And finally, in the category “teacher training/e-tutors” the studies are targeted specifically for teacher training in the field of technology or, for example, the development of e-skills tutors within the context of e-learning.

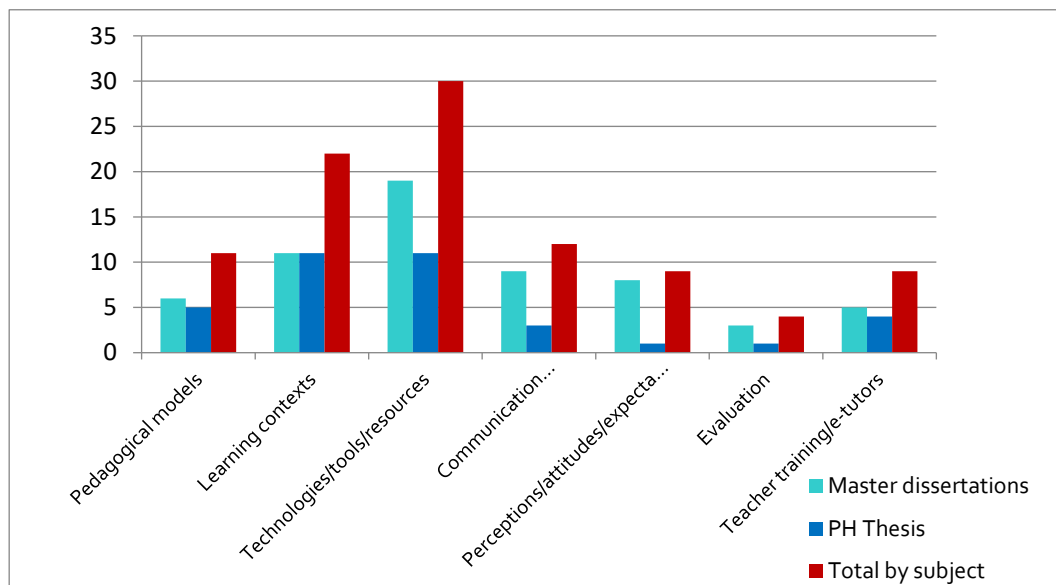


Chart 2. Distribution of studies by topic and by type

Although without sufficient systematization and an exploratory perspective, it can be noted that most studies are descriptive, resulting from observation of situations and are carried out in institutional case studies or questionnaire surveys practices, coming close to what is identified in the literature in this area (e.g. Aczel et al., 2006).

Final remarks

We can identify some difficulties in the development of this study, namely those related to the identification of corpus analysis, in phase 1, and the constitution of the samples in phases 2 and 3.

In the first case, the difficulties referred proved to be real, since the systems of academic databases of document services are shown incomplete, some of the documents are not available, and particularly some of the most recent yet were received in the repositories. In those situations, and once identified, the authors will be requested, via email, to provide a list of their work, or an organized list will be made available, asking them to complete it (cf. Cardoso, 2007).

In the second case, the constitution of the sample for discussion groups and the Delphi study may pose problems, especially in the coverage that may be threatened by the availability of researchers' access to participate in the process.

This study implies a conceptual and methodological unique and therefore exploratory path. Its implementation will contribute to broaden the spectrum of research practices in higher education in Portugal, following international trends that prompt innovation in this field. Not to be regarded as an action research study, neither having its characteristics, it can, however, make a contribution to the awareness of the scientific community to the research practices and the way they are factors of innovation and creation of future scenarios in the field of distance education and e-learning.

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LANGUAGES FOR SPECIFIC PURPOSES – LANGUAGE CENTRES FOR CULTURAL HERITAGE PRESERVATION

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Summary

The project meets the need for communication among those active in material cultural heritage preservation and valorisation in the multilingual European environment. To this scope, it offers complete and easily accessible possibilities for learning and being assessed in major and less spoken European languages in the specific frame of the discipline according to individually experienced needs.

The initiative is aimed at enhancing both distance interaction and physical mobility within Europe and outside its borders by facilitating information sharing, knowledge transfer, problem discussion and network development. It is addressing students and museum/cultural site professionals, and is leading to the implementation of Language Centres for Cultural Heritage Preservation. These are conceived as an open-ended network founded upon harmonised virtual campus infrastructures; utilising the same course and examination material; and obeying a common framework for teacher qualifications. The Centres are proposing a number of alternatives for mastering the specific linguistic requirements of the discipline in what concerns learning, certification and assessment at levels B1/B2. Besides English, several major and less spoken languages of the Mediterranean area are covered, namely Spanish, French, Italian, Greek and Slovenian. All courses are offered conventionally or on-line; while examinations can be performed in distant classrooms, according to a hybrid scheme of real time communication. Alternatively, learners may choose to work with a teacher in one-to-one or group frames, and be examined in a face-to-face manner. Finally, any intermediate choice of limited physical attendance is possible.

Based on a large survey and a careful needs analysis, newly developed and accurately adapted products covering the learner-teacher-examiner triangle are implemented and constantly evaluated. Moreover, specifically developed material for teachers and assessors ensures systematic certified training.

Products destined to learners consist in self-assessment courses; self-assessment progress tests; tailor-made one-to-one courses, anticipating a tutor; and examinations. Resources for teachers include multilingual guidelines; and especially designed Teaching Knowledge Tests for the target languages.

At a first phase the product modules are set up in English. This edition is tried in real conditions; then the material is translated and linguistically adapted for further languages; it is as well evaluated before it enters the Centres. Finally, all modules are actually implemented as pilot activities, intended to enhance student feedback and proceed to necessary modifications.

General Framework

Multilingualism is a fact of life in the European Union. Promoting language learning is central to the European Union language policy; and everyone is encouraged to learn and speak more languages, in the interests of mutual understanding and communication¹.

The European Commission is entrusted with promoting language learning and linguistic diversity across Europe as part of its aim to improve the mastery of basic language skills in the area. Within this context, the European Commission is working with Member States towards the objective of enabling citizens to communicate in at least two languages in addition to their mother tongue.

The over-arching activities of the Directorate General for Education and Culture in the field of languages are outlined in detail in the 2008 communication *Multilingualism – an asset for Europe and a shared commitment*.²

Priorities in the field of languages include several important objectives:

- To retool education systems in the Member States so that the students graduate with higher competences in foreign languages;
- To gather data in order to monitor progress towards indicators and benchmarks of language teaching and learning to encourage multilingualism as a pathway to improve employment prospects and free movement in the European Union;
- To reward innovative initiatives in the field of teaching and learning languages³.

Recently, the European Council came to notable conclusions on multilingualism and the development of language competences⁴. The conclusions are based on the considerations that:

- Linguistic diversity is a fundamental component of European culture and intercultural dialogue, and that the ability to communicate in a language other than one's mother tongue is acknowledged to be one of the key competences which citizens should seek to acquire;
- Language competences contribute to the mobility, employability and personal development of European citizens, in particular young people, in line with the objectives of the *Europe 2020* strategy for growth and jobs.

¹ http://ec.europa.eu/dgs/translation/translating/multilingualism/index_en.htm

² European Commission, 18 September 2008, COM(2008) 566

³ http://ec.europa.eu/languages/index_en.htm

⁴ Council of the European Union, Education, Youth, Culture and Sport Council Meeting, 20 May 2014, 142692

Thus, the European Union invited Member States to:

- Adopt and improve measures aimed at promoting multilingualism and enhancing the quality and efficiency of language learning and teaching, including by teaching at least two languages in addition to the main language(s) of instruction from an early age and by exploring the potential of innovative approaches to the development of language competences.
- Make greater use of European transparency tools and initiatives designed to support and promote language learning, such as the *Common European Framework of Reference for Languages*, *Europass*, the *European Language Portfolio*, and the *European Language Label*.
- Explore ways of increasing the attractiveness of, and ensuring greater commitment towards, language learning, including through the use of ICT and Open Educational Resources, with a view to reducing the number of learners who abandon language studies before attaining an adequate level of proficiency.

Preparation of materials

Preparing material for Languages for Specific Purposes courses and teaching relevant student groups is an experience bearing an intermediate status between philology and various specific fields of knowledge. These may expand from law, economics, engineering, or health sciences to tourism, aviation professions, accounting, or business in general.

Both planning/authoring contents and teaching Languages **for Specific Purposes are distinct from analogous tasks related to Languages as a Second Language**. Students aspiring at specific skills are usually adults who already have some acquaintance with the target language, and wish to communicate a set of professional skills and perform particular job-related functions. In fact, the learners have a distinctive interest for learning subject knowledge and well-built adult learning strategies. Thus, material concentrates more on language in context than on grammar and language structures, an approach that greatly enhances the relevance of what students are learning⁵.

The adequate level of knowledge for Language for Specific Purposes learners, as referring to the common reference levels and sub-levels approved by the *Common European Framework of Reference for Languages*, may vary from basic to proficient user according to the subject in consideration; and the tasks to be performed by the individual professional or university/vocational student.

Aims and Objectives

General aim of the project is meeting the need for efficient communication among those active in cultural heritage preservation and valorisation in the multilingual European environment, by offering complete and easily accessible possibilities for learning and being

⁵ Fiorito, L. (2005). *Teaching English for Specific Purposes (ESP)*. <http://www.usingenglish.com/articles/teaching-english-for-specific-purposes-esp.html>

assessed in several European languages in the specific frame of this highly inter-disciplinary subject.

To achieve this goal, the profoundly diversified educational backgrounds and ISCED levels of the target groups – students, vocational trainees, and professionals active in cultural heritage safeguarding and valorisation – should be seriously taken into account, nevertheless without creating barriers in the choice of particular teaching/learning modules and packages. In addition, individual interests should be addressed, in order to attract professionals to the scheme proposed; while quality should be ensured at every phase.

Concrete objectives of the project are therefore:

- Developing courses and examinations of all types, at the linguistic levels agreed upon and fully based on the Common European Framework for Languages, within a shared pool of linguistic resources, and following the same patterns.
- Adopting a learning-outcomes-oriented, strictly modularised form, permitting individualised attainment of knowledge and skills.
- Offering both face-to-face and on-line courses and examinations, in order to guarantee flexibility in time and location, without implying obligatory ICT literacy.
- Covering major and less spoken languages of the Mediterranean area.
- Training and testing tutors and teachers adequately for enabling them to deal with all aspects of these focused-on, personalised learning activities.
- Certifying every type of knowledge and skills acquired.
- Integrating all activities within accredited LSP Language Centres.
- Operating the Languages Centres under real conditions.
- Disseminating the products within already fully operating Intensive School schemes.
- Sustaining the initiative by implementing a LSP Language Centres Network.
- Implementing the Language Centres Network in the Southern Mediterranean basin.

Realising these objectives will bring a substantial amelioration in the interaction among those active in cultural heritage safeguarding and valorisation all over Europe and beyond its borders. As a matter of fact, in this frame physical mobility at all levels and for all types of employees and workforce will be smoothened and enhanced; while interactive communication will be greatly improved.

Furthermore, the certified courses and examinations, designed on the basis of learning outcomes, will permit evaluation of individual achievements, and the European Language Portfolio will guarantee transparency of qualifications.

Realisation Phases

The work programme is designed in order to proceed to a gradual realisation of the objectives, and finally yield fully operational Language Centres on Cultural Heritage Preservation. The realisation phases read as follows:

- A survey and a needs analysis permit defining content, type and format of products.
- A multilingual *corpus* of pertinent documents is compiled. The *corpus* serves as a shared pool of resources, indispensable for creating the products in all target languages; but as well necessary for designing the framework for the course and examination material, in what concerns contents of modules.
- Products of previous collaborations are accurately enlarged, and totally new ones are developed. They cover self-assessment courses, progress tests, one-to-one courses, and examinations; and are designed for on-line or face-to-face use.
- At first, a complete series of products – partly based on adapted available material – is set up in the common working language English, which is ensuring involvement of all partners; and is evaluated.
- Products in all languages are developed. They use linguistically adapted contents, deriving from the English edition and the *corpus*. After being tested, the evaluated versions are included in the Language Centre material. They are designed for on-line or face-to-face use. Target languages are Spanish, French, Italian, Greek, and Slovenian.
- The manual developed in English was translated to the target languages, while being adapted to their particularities. Evaluation of the manual was carried out by experts; and is taking place by teachers and students in specialised Intensive Schools, and in the frame of an Erasmus Mundus master's course in archaeological materials science. Moreover, available interactive material was adapted to the target languages and translated.
- Teachers are offered a systematic certified training, including especially designed Teaching Knowledge Tests, training-the-trainers courses, and regularly organised workshops.
- Multilingual guidelines are compiled, informing on acting in a virtual environment, designing syllabi for any request, and performing examinations.
- A European Language Portfolio is purposely developed.
- Accredited LSP Language Centres and an open-ended relevant Network are implemented.
- Pilot operation of the Centres under real conditions is performed and evaluated.
- Establishing the Centres presupposes a series of ICT-related activities – realising a multilingual educational web portal, harmonising video conferencing infrastructures, developing the on-line form of courses and examinations, and evaluating the usability of infrastructures and on-line material.

Quality of the products and activities is guaranteed by teacher training, and further by:

- Creating a register of teaching staff.
- Externally evaluating the outcomes.
- Accrediting LSP Language Centres.

Apart from the implementation of the LSP Language Centres Network, the dissemination and exploitation strategies include:

- Development of an attractive web site.
- Establishment of a support and information point.
- Overall dissemination of information on the Centres and their products.
- Organisation of awareness-raising workshops.
- Integration of products in already fully operating Intensive Schools.
- Development of a register of policy makers.
- Authoring of a special document for policy makers.

The project is based on the close interaction of four partner categories:

1. Institutions teaching cultural heritage preservation and valorisation, that: have adequate expertise for selecting the contents of the linguistic products; may serve as pools of learners; and are able to evaluate the final products as to their compatibility to the learning outcomes. All academic institutions have established graduate/postgraduate courses in cultural heritage preservation and valorisation, while the European Chemistry Thematic Network has committees on linguistic issues, electronic testing, and Intensive Schools; and bears a substantial awareness-raising, dissemination and exploitation potential.
2. University language teaching units, and foreign language schools, *i.e.* organisations representing the target languages, that have proved expertise for creating the linguistic material in the target languages; serve as pools of certified teachers; and are able to evaluate the final products from a linguistic point of view. All academic institutions have departments on largely spoken languages, and specialised centres for teaching their national language. The language schools are offering target languages at all levels. The common working language English is also taught in organised form.
3. University or professional ICT experts for proceeding to relevant activities, that is creating the web site, the information point, and the web portal; harmonising video conferencing infrastructures; developing the on-line form of course/examination material; and addressing the usability evaluation of infrastructures and on-line material.
4. Professional partners dealing with cultural heritage preservation and valorisation, *i.e.* museums, sites and restoration units that have adequate expertise for testing the linguistic products; may serve as pools of learners; and are able to evaluate the final products on the work place.

EDMONDO: IMMERSIVE TEACHING/LEARNING EXPERIENCES IN ITALY

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Abstract

This paper presents the state of art of an on-going immersive training experience based on Virtual Reality currently held at INDIRE, the National Research Institute of the Italian Ministry of Education and Research.

The immersive world created by INDIRE is called Edmondo and is used for different learning and training projects both for students and teachers.

This paper illustrates an Action-Research project planned and carried out in Italy with a group of teachers engaged in training paths to improve their language competences in English and their methodological competences related to the use of immersive technologies at school.

The Objectives

INDIRE is the National Research Institute of the Italian Ministry of Education and Research. The Institute has been dealing with a number of issues in recent years, mainly related to educational research, innovation and training.

The focus of this paper is an Action-Research Project designed by INDIRE, aimed at experimenting the potential of immersive technologies to improve English teachers' competences through a devoted training plan and through the implementation of lesson plans in class with the use of virtual worlds.

The Framework

The virtual approach to the educational area is found in the combination of media and has been commonly recognized over the last few years as a very effective and powerful tool to enhance the learning/teaching dimension.

In particular, the focus of this research is on EFL (English as Foreign Language) and on CLIL (Content and Language Integrated Learning), that can get a significant added value from the use of immersive technologies.

According to the social-cultural and constructivist approach, meanings and understandings grow out of social encounters that represent the starting point of the learning experience.

Therefore, virtual world environments are commonly associated with technologies and activities that support collaboration and with instructional strategies such as simulations, group projects and study case discussions.

The phases of the Research project

The research project stems from this research question:

Can immersive technologies enhance the teaching/learning process with particular attention to the English language teaching (EFL) and to the learning of curricular subjects through a foreign language (CLIL)?

Step 1

The first step is based on the literature review about immersive technologies in EFL and CLIL, through recognition of the main national and international contributions to this field.

This step also includes the analysis of the theoretical framework of the virtual reality and immersive learning and the identification of the most common virtual tools currently being in use in national and international institutions for the teaching of English as a foreign language and for CLIL methodology.

Step 2

This step is aimed at planning training paths for teachers developing two different pathways:

5. an English language course for teachers in Edmondo, aimed at B1/B2 level of CEFR;
6. a methodological course for teachers in Edmondo, aimed at developing skills related to the teaching of English and the teaching of disciplinary contents through English in an immersive world.

To this extent, a very important task is to identify useful and appropriate tools in Edmondo to design virtual scenarios for the immersive learning experience to develop speaking skills in English and methodological skills.

Step 3

This step includes the assessment of the training paths carried out in Edmondo, through the use of different tools, such as self-assessment questionnaires, portfolios, diaries, narrative tools, peer evaluation etc. aimed at fostering reflective practices within a virtual community of teachers. The use of social networks such as Facebook is particularly effective to share ideas, experiences, good practices in the immersive world.

For example, Edmondo Facebook group has collectively produced a nice and amusing slogan:



Figure 1. Edmondo slogan

Step 4

This step includes the teachers' planning and experimenting of lessons in Edmondo, with students of different school levels, according to guidelines, hints, prompts and suggestions.

In particular, the focus of the research is on an English lesson at primary level and on a CLIL lesson at upper secondary level. Through quantitative and qualitative research tools, the different phases and aspects of the lessons will be recorded, explored and analysed.

Step 5

A final report will include the outcomes of the research, with guidelines, suggestions and hints to the teachers, also with reference to scenarios and technical features that best suit the different teaching strategies and learning objectives.

Outcomes

This research is aimed at proving the added value of 3D environments and collaborative online tools in the teaching/learning of English.

As the research is on-going at the moment, we only have partial outcomes that mainly refer to the teachers' reactions to our proposals. They are currently attending their training courses and planning their activities with the students. Their mid-term feedback is extremely positive both in terms of language competences and methodological competences. They seem to have discovered a new world, with a huge potential that may enrich their personal and professional profile and their relationship with the students.

By the time of the conference, we will have implemented our research tools and collected useful data that will enable us to analyse and evaluate the research outcomes. We will then be able to present a holistic picture of our research project.

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MATH FORMULA EDITION IN LMS, PRESENT AND FUTURE

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Current situation

Learning platforms (LMS) typically pay very little attention to STEM tools. Teachers or content creators in the fields of science, technology, engineering and mathematics face serious difficulties when creating materials for their students, often having to deal with scripting languages and poor WYSIWYG math formula editors, poor both in functionality and in supported devices.

If the students are required to type in themselves the math formulas, for example as the answer to an exercise, or in a forum, these limitations can become insurmountable.

Luckily, some platforms have begun paying more attention to their original limitations in this field, but there are still huge differences among them.

Parameters for a benchmark

When it comes to formula edition, as with any other content type, there are two key moments involved in the communication act that educational content implies: the moment of creation and the moment of reception, which is the moment when the user views the created content.

Relevant benchmarking will address both moments. More precisely, at edition time the following parameters will be addressed:

1. Technology: Some solutions require additional software or plugins being installed. The dependence on Java is nowadays outdated, as most actors have had such dependence in the past, but have grown out of it by now.
2. Usability: Whereas it seems admitted that WYSIWYG is the simplest, most efficient paradigm, it is reached to different degrees. Besides ease and speed of use, additional features of usability are accessibility support and amount of coverage of the content creator's needs.

At view time, we will assume that the final user gets a visual representation of the formula, that is, they get a formula in the typical math presentation more or less close to the MathML standard (www.w3.org/Math/). This time, taking this baseline for granted, we will look at:

1. **Quality of the representation:** This refers to both the accuracy between the content creator's preview and the final result, and also to parameters like font choice, screen legibility, alignment, etc.
2. **Accessibility:** We refer to accessibility as the ability to produce an alternative access to the formula to the users who cannot view it. This alternative access is a verbalisation or verbal description of the formula. A legal requirement in many countries, it is a requested and valued feature anywhere.

With these parameters in mind, let us see the options we have selected for a benchmark.

A benchmark

In order to produce a relevant benchmarking, we embrace some of the most popular learning platforms worldwide. We have chosen Blackboard Learn, Canvas by Instructure, Itslearning, Learning Studio by Pearson, Fronter and Moodle.

Three of them include the third-party formula editor WIRIS as their default math formula editor, so they will obviously be discussed together. Canvas and Moodle can integrate WIRIS editor as an optional plugin but they offer native support for creating math formulas. We will of course discuss the native tools for the benchmark's sake.

Table 1: The Learning Management Systems and their performance regarding math formula edition

LMS	SOLUTION	USABILITY			ACCESSIBILITY	UPGRADE AVAILABLE
		EDIT	PREVIEW	QUALITY		
Blackboard Learn	WIRIS editor	WYSIWYG Complete toolbar	Real WYSIWYG	Web fonts Good alignment	UI accessible Automatically accessible contents	
Itslearning						
Learning Studio by Pearson						
Canvas by Instructure	Open source	WYSIWYG Missing symbols	Preview different from result	LaTeX fonts	UI accessible Relies on other components	
Moodle	Open source	Scripting with preview	LaTeX scripting	LaTeX fonts	Relies on other components	

Let us now discuss what the colouring of the table means and how the choices are justified.

Technology

All the analysed LMS's perform correctly on the technology chapter, as all of them provide a non-Java interface that runs on tablets and phones. This is not the case for other less popular actors, like Fronter by Pearson, which runs a Java-based math formula editor. Note that this column is not on the table as all the benchmarked items perform equally.

A finer point here is the amount of data that travels back and forth between the math formula editor and the LMS. WIRIS beats by over ten times the other two solutions, which means that less than one tenth of the data travels between WIRIS and the platform than between Moodle or Canvas and their native math formula editor.

Usability

Here begin the big differences. Canvas provides a WYSIWYG solution, albeit not beautiful, but it performs decently on this chapter as it provides a good amount of operators organized on tabs. We have granted a yellow cell to this authoring tool in this chapter. Let us see what the actual edition mode in Canvas looks like:

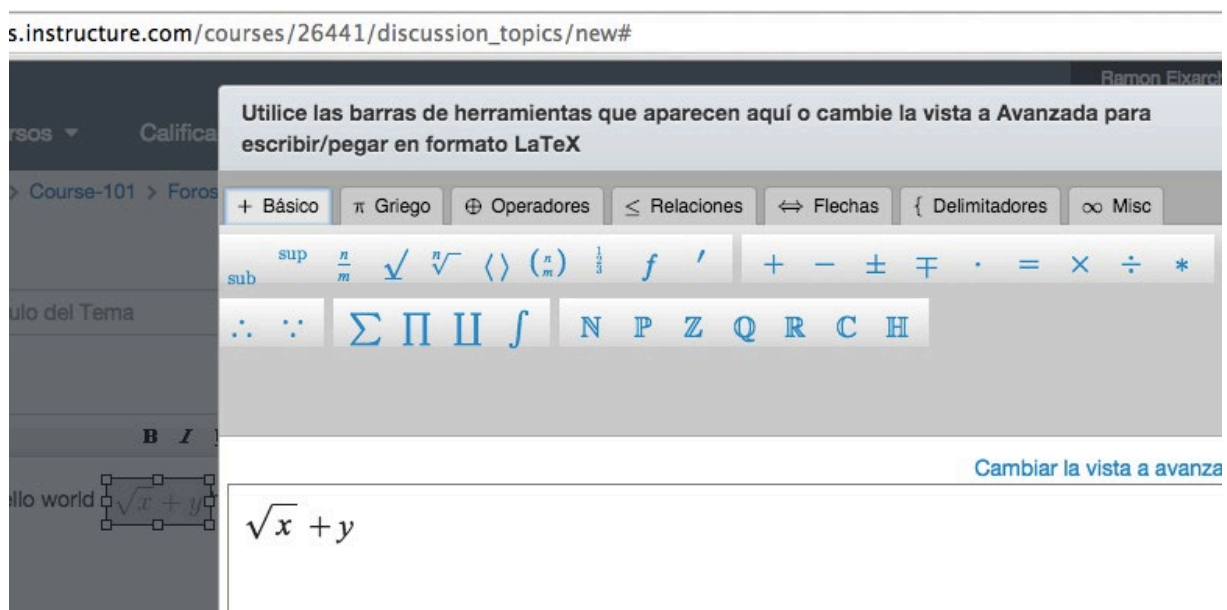


Figure 1. Canvas math formula edition

On the other side, Moodle provides a preview on a pop-up that shows in real-time what the outcome of the formula will actually be, but the edition is not WYSIWYG, as the user has to work based on the scripting language LaTeX and an arrow that shows the cursor position at any time on the resulting formula. Again, let us see it with an example.

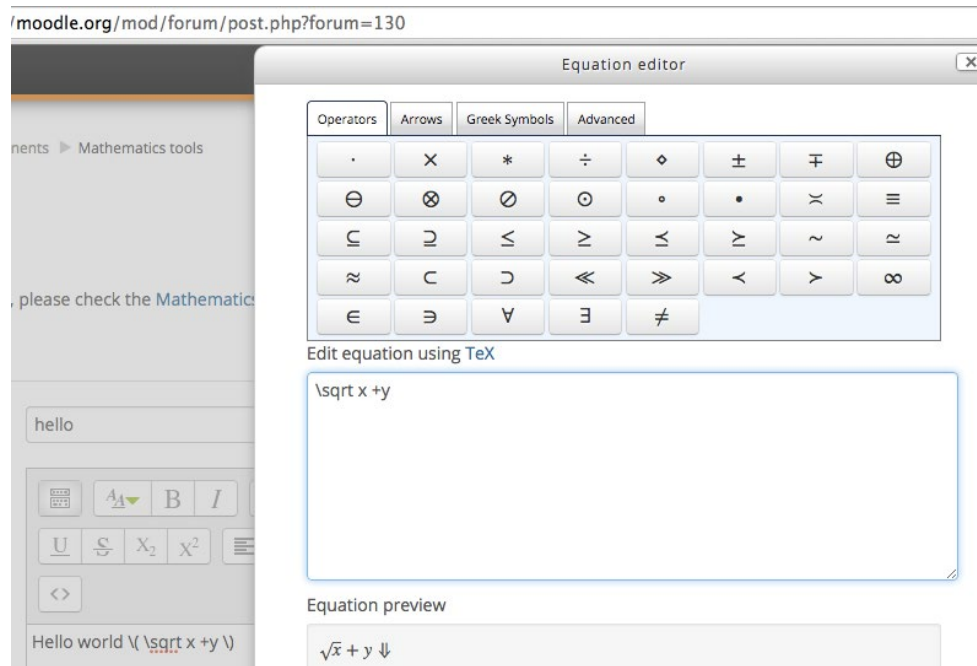


Figure 2. Moodle math formula edition

Finally, the LMS's based on WIRIS editor, provide a fully WYSIWYG solution, also based on tabs and presented on a neater arrangement than its Canvas counterpart.

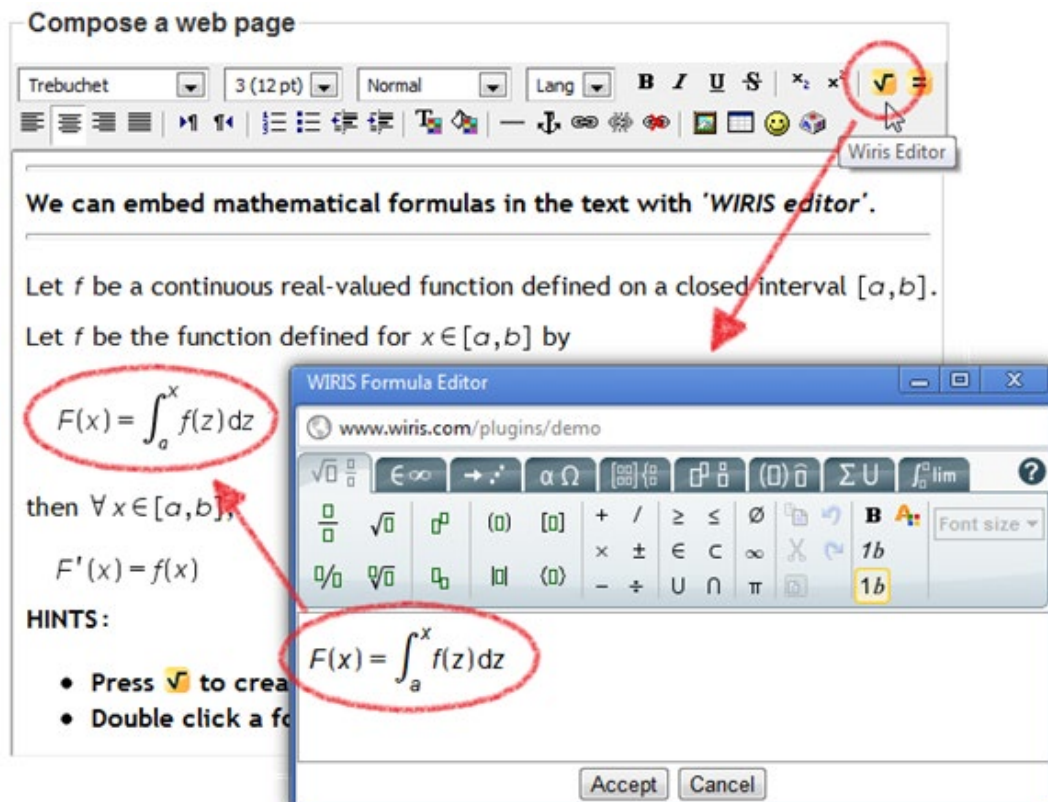


Figure 3. WIRIS math formula edition

Preview

The preview of the WYSIWYG is supposed to provide the content creator with the image of what the outcome of his work will be like.

Moodle cannot be discussed here, as the preview is based on LaTeX scripting to detriment of a visual presentation. Canvas does a better work by providing a preview. The formula is correctly and visually displayed, but sadly its final alignment and position do not correspond to the final result of the content creator's work. As can be seen on the following picture, what appeared as a space between the formula and the text disappears in the final result.

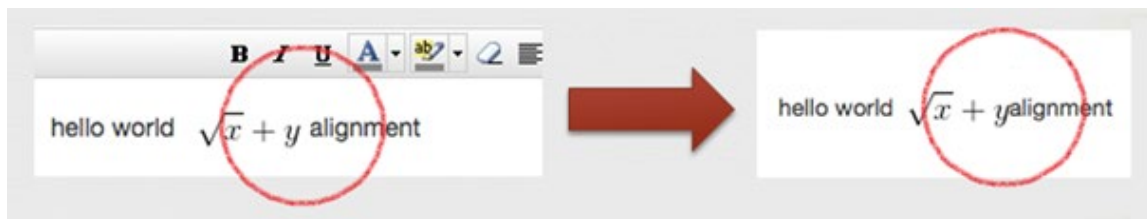


Figure 4. Preview of the outcome

WIRIS editor provides here a real WYSIWYG preview mode by not modifying the previewed and stored result.

Quality

To go into more detail on this presentation chapter, let us now turn to the actual quality of the math formula. Please have a look at the two outcomes, the leftmost from Canvas, the rightmost from WIRIS:



Figure 5. Quality of the outcome

The first obvious thing is that, whereas curvy text and serif typefaces can look nice on paper, they are much less legible on the screen than sans-serif fonts. The curvy style was popularized a few decades ago by the LaTeX scripting language and its complete domination of the publishing market in this area. Today, with user reading math formulas on their screens, tablets and smartphones, this seems a much lesser wise choice.

The second big difference is yet a position problem. The baseline of the formulas and the baseline of the text are not aligned in Canvas (left) and only WIRIS provides a reliable inline representation.

Accessibility

Finally, Canvas and Moodle rely on the user for accessibility, which means that a MathML or LaTeX reader needs to be incorporated to their screen reader in order for the formula to be accessible to visually impaired users.

WIRIS integrates accessibility in an automatic and natural way by adding an “Alternative text” tag to the generated formula, which is stored as a regular image into the content.

Conclusions and future perspectives

We have presented how we estimate Canvas solution to be superior to the Moodle one when it comes to creating math formulas. Both solutions fall short of technical and accessibility features when compared with WIRIS.

WIRIS is an optional plugin for Moodle and Canvas and many universities and publishing houses are adopting this solution to overcome the natively provided math editors in their platforms, as they also experience the limitations that we have discussed here.

The next-generation math formula edition will allow for handwriting recognition of the formulas created by users, typically using their tablets and smartphones for this action.

NEEDS FOR ELECTRONIC DEVELOPMENT OF MODULE-LEVEL COURSE CONTENT AT BUDAPEST BUSINESS SCHOOL

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Introduction

One of the four strategic goals of Budapest Business School (BBS) is the pedagogical-methodological development of courses. We would like to achieve this partly by continuously modernizing the content of courses available at the College, and partly by developing the virtual (electronic) teaching and learning environment. The aim is to create electronic course content applicable for all levels in all degree programs, or even as additional material to supplement traditional classroom lessons on full-time courses. In order to be able to achieve our strategic goals and set forth concrete steps, we need to examine the present situation, which involves the analysis of external and internal factors.

Preliminary survey

At the meeting of 21 June 2013, the Senate of BBS decided to conduct a preliminary survey of our students. According to the decision, the survey should focus on mathematical, foreign language, IT and study skills of the students admitted to the College. The Senate's intention is that the survey should help to

- reveal the level of theoretical knowledge the students acquired during their secondary school studies;
- reduce the drop-out rate by opening paths to offer supplementary courses to students lacking in knowledge or certain skills;
- preserve the quality and efficiency of our instruction through providing courses that match our students' knowledge;
- provide feedback for our students.

Bearing in mind the curricula being used in secondary schools, our presumption is that the skills measured do exist on a basic level. A lack of these skills, however, may greatly hinder our work in the coming semesters.

In our view, it is extremely important to examine our students' study skills as quite a few of them are having trouble studying on their own.

The survey was carried out partly in classrooms – the traditional way, and partly electronically (via Coospace and Moodle). Using the electronic systems gave us further insight into our students' ability to use such electronic platforms.

The results of the survey were analysed and distributed to both lecturers and students. The results served as a basis for our teachers to launch supplementary courses with a view to helping students with remedial needs.

The supplementary courses were held partly in traditional classrooms, partly in an electronic environment.

Electronic developments in BBS

In recent years we have placed great emphasis on creating electronic course materials. These include materials that cover a course's whole content and supplementary materials. Partly or fully electronic materials have been developed for twenty subjects in the past academic year alone. The focus has been on subjects which are important for but may cause great difficulty to a great number of students of Business Mathematics, Economics, Statistics, and Accounting.

Recognising the fact that demand for more and better quality digital content has increased, we have created a set of standards to be used for the preparation of electronic materials. The standards include the following elements:

- an extended description of the course content, divided into twelve units (usually we have twelve study weeks during a semester for full-time students);
- a description of the skills required with each unit;
- a minimum of five review questions for each unit;
- supplementary materials for each unit (e.g. a presentation or a problem task);
- a glossary of terms.

In the case of several subjects we have provided additional materials to satisfy the demand of the more dedicated students.

It is eminently important that these developments require our lecturers to rethink their tasks concerning student-student and student-teacher cooperation, assignments, problem-solving, deadlines, examinations, etc. To help our teachers cope with these tasks we are providing regular training.

The first phase of the development project (in which students also participated) ended in November 2014, so its results can be put to use in the academic year starting in February 2015. The evaluation of our teachers' and students' experience concerning the project will be carried out after the end of the spring semester.

Scope of applications and further tasks

While developing the course materials we realised that they should be available to various groups of users. In order to achieve that goal, we intend to split the course blocks into further units.

This would allow us to utilize the same module for students on different level programs. Thus full-time BSc students in need of remedial studies may have access to materials used on short-cycle professional courses; or, they may have access to some of the elements of an MSc program.

The benefits of developing lower than course-level modules seem quite obvious, especially if our intention is to extend the range of our available training programs and the number of participants on these programs.

To achieve the goals mentioned above we are considering ways of adapting our BSc materials for use in remedial courses as well.

We consider it as one of our tasks to find a solution to a serious problem often arising in connection with electronic courses, namely, to maintain the motivation of students and to reduce the drop-out rate. We will also need to tackle the problem of how to take a remedial course into account in relation to the fulfilment of a course.

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EXPANDING LEARNING SPACES IN HIGHER EDUCATION – UNDERSTANDING A HYFLEX MODEL

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Introduction

In this paper, we seek to investigate the interplay between space, interaction and learning sequences in a higher education HyFlex learning environment. HyFlex is a model where the course design combines physical and virtual spaces and face-to-face with online learning. “Hy” stands for hybrid and “Flex” for flexibility (cf. Kyei-Blankson & Godwyll, 2010; Abdelmalak, 2014). The paper presents an on-going research project and aim to discuss some tentative findings focusing on different aspects of spaces and interaction in a HyFlex learning environment using the theoretical perspective Designs for learning (Selander & Kress, 2010).

This certain HyFlex model has been developed at Malmo University during a couple of years, first and foremost within the master program “Communication for Development” (wpmu.mah.se/comdev). In Teacher Education 90 credits, students can, in some courses, choose if they want to attend lectures and seminars on campus or online. Lectures and seminars are filmed, live streamed and then published on a learning platform. This means that some students will attend for example a seminar in the physical campus space, while others choose to attend online in the same time. The remote students follow the campus seminar via a live stream and can participate in the interaction through a chat function. One aspect of HyFlex can be a self-pace design (cf. Khan, 2007). This is however not the case in our study. The course design is tailored for both modes, that is on campus and online, but students has the same content and the same final assessment, regardless of their chosen path during the course. For the teacher, this HyFlex model means that he or she is performing in front of a camera, with a live student audience in the room and another remote audience online. The recordings and the streamings are facilitated by another teacher, who is also present in the campus room. This second teacher is using a chat function to connect with the remote students. One could discuss the distinction between blended and hybrid learning environments (cf. Beatty, 2007; McGee & Reis, 2012). Here we use the HyFlex Model as a more specific conceptualization of blended learning. It focuses on flexibility, design and agency.

Previous research and aim of our study

Research on blended / HyFlex learning environments in higher education concerns several different aspects, like course design and student choices. For example, McGee and Reis (2012) discusses how design and support, course alignment, moderation of interactivity and expectations and technology all are crucial aspects of how a blended learning environment is conceived. Abdelmalak (2014) identifies encouraging student control, differentiating instruction and increasing access to course content as some important themes to consider in a HyFlex design. Other studies concern student choices and results (cf. Lakhal et al., 2014). Inglis et al. (2011) show that even if students are offered different kind of resources in a blended/HyFlex environment, they tend to stick to one choice. That is – if you start to attend online, you continue that road. Furthermore, in their study, online students had lower attainment than those who often attended the learning activities on campus (Inglis et al., 2011). Our focus in this presentation is the interplay between different kinds of spaces and interaction in a HyFlex design. This area, especially with focus on higher education, is somewhat under researched. However, in a fairly similar setting (video conferencing in a campus space) McNaughton et al. (2014) found that:

”Teachers, who brought the imprint of previous ways of using and moving in space, found the material and virtual aspect of the shared place of videoconferencing to significantly affect their practice, especially their sense of connection with students. They experienced conflict between pedagogical goals and the spaces and material environment.” (p.97)

When the teacher moved around in the space only one third of the room was used in a repetitive way. Furthermore, the teacher felt disconnected from the remote students. That is, the design of the space and the framing of a video conference affected the interaction both in the campus space and online. This connects to the aim with our study; to investigate the interplay between space, interaction and learning sequences in a higher education HyFlex learning environment. The following research questions are asked: What kinds of different spaces are connected in a HyFlex model? How are the spaces designed? And how do the participants interact in the different spaces?

Theoretical framing

For theoretical anchoring, this project draws upon a multimodal design-oriented perspective called “Designs for Learning” (Selander & Kress, 2010). This perspective offers a way to understand space with the concepts designs *for* learning and designs *in* learning. Designs *for* learning highlight the conditions for learning as institutional framing, norms, curricula, learning resources and didactic design. Designs *in* learning focus on how both teacher and students design their learning path during a learning sequence. In relation to a HyFlex learning environment, designs *for* learning helps us to understand how different spaces, both in the physical and virtual room, constitutes essential elements in communication and interaction. With designs *in* learning we could deepen our understanding of how different spaces become resources in a meaning-making process. In relation to space one could focus

on how teachers and students use different resources in a space in their interaction, one could also focus on how the different spaces enables or constrains interaction. Designs for learning stems from a multimodal understanding of interaction and communication (Selander & Kress, 2010) and connects to the idea that humans use a variety of semiotic resources, including space, speech, gesture or text, in order to communicate. In this paper we think of space in relation to negotiation and transformation, that is, a space can shape interaction, but interaction also shape space (cf. Leijon, 2010, forthcoming).

Design

The case study combines video observation with interviews. However, the first part and this paper concentrates on observation of filmed material and chat conversations from streamed lectures and seminars in a teacher education course. Focus in this part of the project is the teacher interaction in relation to the different spaces and the students. The filmed material offers different angels of the interaction in the spaces. Furthermore, it is this perspective that the remote students get when they participate online.

To broaden the perspective we are, in a second stage, going to combine this material with video observation in the campus setting and with interviews. The tentative results in this paper, however, stems from observations of the streamed material. The material is analysed from a multimodal perspective (Kress & van Leeuwen, 2001) focusing on both visual and auditory information and connects as well as the participants use a variety of semiotic resources, including space in their communication.

Ethical considerations

Careful ethical considerations were made to ensure the participants consented, and the participants were informed of the purpose and the implementation of the study both verbally and in written text. The participants were informed in advance of the decisions on how the material was going to be represented, and they were told that their faces would be cropped and/or blurred in order to hinder identification (cf. Pink, 2007).

Both article authors have their own experience from working in this HyFlex environment as teachers and one as facilitator. In this case study one of the authors participates as a facilitator. It means we have somewhat different perspectives since one author has experiences from the physical space only while the other one from both physical and the online spaces.

Preliminary results

The results that are presented in this paper are very much tentative and we raise more questions than we answer. Using the theoretical concept *Designs for learning* our preliminary findings highlights questions about who is the designer in a HyFlex environment? It is the teacher that frames the learning sequence with a didactic design, but does he or she have agency and ownership of the design of the space? In a HyFlex learning environment with live streamed lectures and seminars several different spaces are shaped. Here we will highlight some examples:

First, we have the physical setting at campus, that could be a seminar room or a lecture hall. The students that chooses to attend on campus enters a room that is designed to be functional for the live streaming session. This means that both students and teacher have to consider how their interaction in the learning sequence (designs in learning) in the physical room is affected of the technical resources for the streaming, that is camera and microphone. They also have reflect upon that all their interaction is being filmed and live streamed. Maybe the design *for* learning somewhat constrains their possibilities to interact and designing their way *in* learning? Does increased flexibility online means decreased flexibility in the campus space? Our observations highlight a transformation of the campus space to a fairly traditional lecture space, with a limited stage for the teacher and the students.

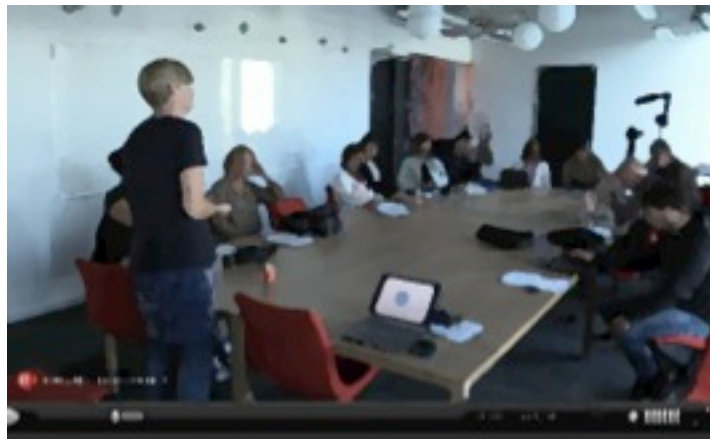


Figure 1. Example of a HyFlex setting campus space

Second, designs *for* learning also concerns the space the facilitator designs for the streaming. Choosing camera angles, clips and so on, the facilitator designs the representation of the interaction in the physical space for the remote students. The facilitator is the only one with connection to this second space, constructed of a blend of both campus and virtual spaces.

Third, there is this virtual space that the remote students meet when they connect with their laptop. From the teacher perspective, this space is out of reach as it is designed by the other teacher in the campus room, who facilitates the live streaming. The performing teacher (and the students) has no access to how they are represented online. Unless they follow the streaming in real time, using their laptops or mobile phones, while attending the campus space. How does this affect their design *in* learning?

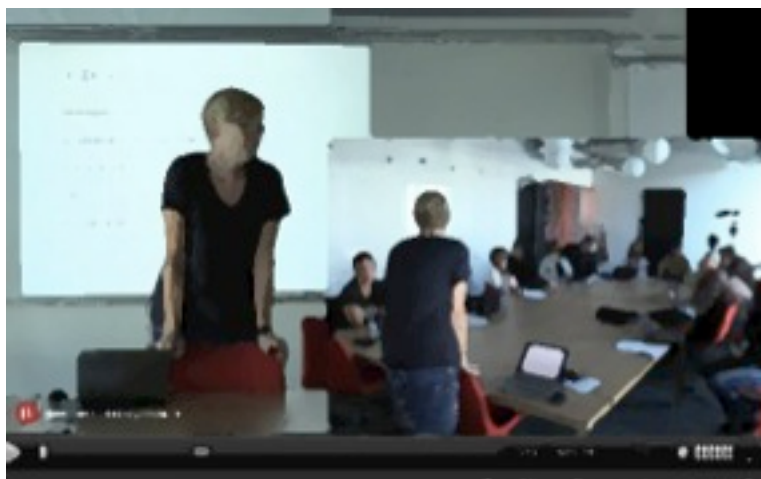


Figure 2. Example of the remote student view

Fourth, a HyFlex setting means the connection between several different space outside campus. The remote students can attend the sessions sitting at a café in another part of the world or at home in their kitchen. How does this blend of spaces affect the interaction?

Fifth, the online students have agency to design a parallel chat space in the same time as the campus discussion. We have observed a student discussion that moves back and forth between technical questions, comments on the lecture and elaborations on the presented topic. The lecturing teacher has no direct access to this chat.

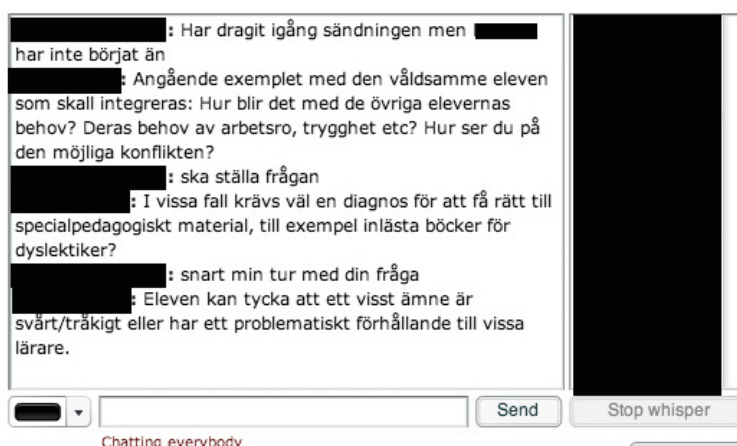


Figure 3. Example of the chat function

This leads us to the important role of the facilitator as a link between the interaction in the campus space and the interaction online. Camera position, angels, frames, clips and so on is the work of the facilitator. Is this a co-designing process or is the teacher in the hand of the facilitator when it comes to representing the communication in their designs *in* learning?

A HyFlex model connects different spaces, and in this paper we have mentioned some. The seminar room connects to student physical environment at home. There is also a disconnection between the campus space and the spaces that are created online, for example in the chat function. It is a complex learning environment a teacher has to reflect and react

upon. With our presentation we want to discuss how does this complexity in a HyFlex model affect the teacher didactic design, considering both designs *for* and *in* learning?

Summary

In this paper we have aimed to investigate the interplay between space, interaction and learning sequences in a higher education HyFlex learning environment using the theoretical perspective Designs for learning (Selander & Kress, 2010). We present some tentative results from an ongoing research project with a main focus on a teacher perspective. In the results we have identified four different kinds of spaces that are designed in this model. A HyFlex learning environment in higher education offers flexibility in time and space for students. Especially from a teacher perspective this flexibility comes with a hybridization of spaces. A hybrid and flexible pedagogic environment includes complex settings and demands collaboration between the lecturing teacher and the facilitator. This HyFlex model points towards team teaching but also raises questions about power, design and agency.

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BLENDING LEARNING DESIGN – THE POTENTIALS AND PITFALLS DESIGNING BLENDED LEARNING COURSES IN A PROFESSIONAL BACHELOR CONTEXT

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Introduction

University College Lillebaelt (UCL) is one of seven university colleges in Denmark established in January 2008.

UCL offers higher education programmes that contribute to the ongoing development of the welfare society. We train social educators, teachers, nurses, radiographers, physiotherapists, occupational therapists, biomedical laboratory scientists, public administrators, and social workers.

UCL aims to train tomorrow's professionals as highly respected key players in a strongly cohesive welfare state, in which generating, spreading, and utilising knowledge contributes to sustainable welfare development.

This year UCL has decided that 30 percent of all educational elements must be generated as blended learning by the end of the year 2015 as part of a modernization addressing following educational needs:

- Blended learning can help match the expectations of the future students who have grown up in digitized homes and schools.
- Blended learning helps **individualization** and **differentiation**. The students can organize their own learning paths – decide for themselves where and when to study, which paths to follow and in what tempo.
- Blended learning helps **provide resources** for the individual subjects (for instance subjects with a high degree of complexity or difficulty) or groups of students (those in danger of dropping out for instance) without necessarily increasing face to face teaching, but by developing asynchronous study activities and learning resources for digital distance learning.
- Blended learning can contribute to supporting and improving efficiency of educational efforts. This can for instance be done through programmes for several classes by using video conferencing, allocating traditional face to face teaching to synchronous and asynchronous study activities produce digital materials which can be employed didactically and reused by the teachers. This can also mean that the particular

competencies which teachers have in Svendborg can be used at other locations in UCL and disseminated to a larger group of students without further costs.

Educational Innovation and Learning Resources (EILR) was asked to develop and support the blended learning implementation strategy. EILR is an inter-faculty unit in UCL, which develops and supports digitization and learning approaches in the professional bachelor programme.

Potentials and pitfalls

This paper addresses the potentials and the pitfalls in the blended learning implementation strategy.

The blended learning implementation strategy contains phases for preparation, development, implementation and evaluation.

Preparation

Arranging deliveries and coordinating collaboration happens in interaction between the designated project manager at the individual education and the manager for educational innovation and learning resources. These constitute a project team, which is efficient. That it is an external person who controls the process and informs the teachers what they must do minimizes resistance and resentment, since it is important to be polite towards guests. It is at the same time important with an insider who knows the everyday issues and conditions of labour. The process is initiated by a meeting between the project team and the educators that must develop a blended learning programme. Typically a group is made up of 20 people from the same institution. One meeting lasts around three hours.

Initially the participants are introduced to the blended learning implementation strategy and the fact that all educators must participate in the process and production of digital materials needed.

Then they are introduced to the formal aims and methods as well as the idea behind the design process and analysis.

Then they work in teams determining which modules will become the object of developmental labour and they initiate development efforts.

Finally the delimitation of the subsequent process is determined and it is clarified how much help they can expect to receive. It is important with a structured approach at the meeting, where it becomes clear what the educators are to do. Knowing exactly what to do and when has a calming effect on many. It is also important for the success of the project that educators get started during the meeting. Using the information given immediately and feeling that some of the work has been done when they leave the meeting is important. It can have a demotivating effect and seem insurmountable if you don't get started till later.

Winnings

The overall winnings of the blended learning strategy is:

- Professionalization of the programmes;
- Quality assurance of lessons;
- Improved efficiency of an new opportunities for prioritising the use of resources.

The aim is to increase the use of Blended Learning in concrete programmes during 2015, as well as increase the competences of those who teach educational courses, such that they develop the overall programme in the direction of blended learning.

In addition, a combination of traditional classroom teaching combined with on-line activities will result in a reduction of teaching [på vidensniveau?], such that time will be released, which can be spent with the students when they practice their skills.

It is important that the educators design and develop their own approaches to blended learning, since it will progress their competencies. If they were merely sent on a course in blended learning design, which would not end with a finished product, then they would only attain a [mediocre] knowledge level and not be able to use the knowledge independently at a later stage. It is also important to clarify that this is a restructuring of lessons, from only teaching [på vidensniveau?] t also having time to spend with the students when they work on their skills.

Many teachers erroneously believe that the process is a budgeting effort and that by conducting blended learning they partake in a process, which will eventually make them superfluous.

Purpose

- Goals for developing the selected educational elements: All modules are expected to be completed in the autumn of 2015 with an emphasis on Blended Learning contributing to an increase in quality and a reduction of face to face teaching. This may possibly to lead to a new use of resources. Definitions and requirements to a blended learning process is written and reviewed by teachers, such that all expectations are made clear.
- Goals for developing teacher competences: Participating teachers must have digital competence at three levels. A few will have minimal competences, more at an intermediate user-level and the majority at the expert level. A target scheme will be handed out and reviewed with the teachers. They will be asked to fill out the form in accordance with their current abilities, desired abilities, and an indication of how they will reach this skill level and with what resources. This form is important for the teachers feel noticed and taken seriously, and they get the help they need.

Developmental phase

The next step in the blended learning implementation strategy is the development phase. The method here is interaction design, which is a very applicable method.

By going through the stages of identifying needs, design, building a prototype, testing, adjustment and evaluation, the teachers attains the competencies needed all the while a blended learning design helps lift the quality of the programme.

Identify needs & design

Identifying needs and designing the blended learning course is an analytical process. The analysis is assisted by a blended learning design model.

The model focuses on how digital learning resources can support study activities. The model invites a dynamic and iterative planning process where you can move between themes and choose, design, revise, and redesign until you have your course.

The analysis is done to allow the lecturers time to reflect on how to change their traditional courses into blended learning courses. Often the aim to adjust our traditional courses into blended learning occurs when problems in the course design are recognized that leads to inactivity, absence or lack of time to speak to the students. Another issue could be to provide students with feedback on an assignment. Recognizing such a problem would be a nice way to start working with blended learning, because you are then motivated to ask: How can blended learning solve my problem? In that manner will digitization become potentializing and not an evil we must force into our traditional courses. This analysis is highly important, because of two typical pitfalls in learning design. First, we often spend the time we have with the students to teach knowledge instead of helping the professional bachelor Students practice skills. Secondly, when we decide to blend our learning design, we often focus on technology and forget about reflection and planning. The blended learning design model can help to avoid that.

In the process of analysis the teachers can draw on support from EILR, which will be distance support via telephone, mail or video conference.

When the teachers have concluded their analysis, they send it back to EILR along with the aims for their competency development. These data are important for EILR in planning the next stage of the development phase, which is for the teachers to develop the digital materials needed in their blended learning process. It is important that there is a deadline in the analysis, so that everybody does their part and they follow each other in the process. Without a deadline some teachers will not complete their task and will be left behind.

Build prototypes

The teachers produce their digital material on the basis of their design process. Here they also receive EILR support.

Two approaches to prototyping have been attempted. In one, the teachers have selected deadlines and developed a workshop together. The workshop gives the best result. Everybody produces digital materials and is mutually inspired by one another. There is an efficient work flow and responsibility is taken by the participants. When the teachers develop their work individually there is a tendency to leave responsibility with the consultants from EIRL and merely wait for them to develop ideas. This does not result in the desired development of competencies.

Implementation

The next step in the blended learning strategy is implementation. Here the teacher's blended learning design is tested in the field. It has been decided that the materials must be tested in the concrete educational practice, such that the teachers get an exact impression of what works and what doesn't. If the students are removed from their context to test the individual elements in the materials the results would not be exact and could thus not be employed for evaluation purposes.

Testing

The teachers test their blended learning materials on their students.

It turns out that teachers express a need for support when the EILR consultants are not there during testing. When the consultants are present the teachers don't need support. There is, in other words, safety in knowing that there is somebody there if the technology fails somehow. EILR are therefore working to train a corps of student assistants that may extend support during testing, since it is an insurmountable task to be present at all testing merely to be present just in case. The hope is for this to be sufficient for the teachers to feel safe.

Adjustment

After testing the teachers adjust their blended learning designs. Sometimes they merely need small changes to some aspect of the digital materials. Other times there is a need for a new analysis in order to identify what failed and what needs redesign. Then the data is resent to EILR. This stage also required a deadline. There is a tendency for the teachers to think that things can be done before they return to the course. However they will often not recall what was problematical when they reach this stage or EILR need the final data in order to evaluate the blended learning implementation strategy.

Evaluation

The blended learning implementation strategy is so recent that the evaluation design has not been developed yet. However, it is certain that the teachers' analyses and adjustments, as well as descriptions of their desired competency attainment will constitute the frame for the evaluation. This data will most likely be supplemented by student evaluations gathered by questionnaire, but also qualitative studies from focus group interviews.

The evaluation will cover goals for developing the selected educational elements, i.e. quality assurance of teaching, but also goals for competency development among teachers, i.e. professionalization of the programmes.

Naturally it is also important that the evaluation determines whether the individual bachelor programme has been able to generate 30 percent of all educational elements as blended learning by the end of the year 2015. The evaluation will take place in the spring of 2015.

Conclusion

We have now looked at the potentials for and pitfalls for the UCL blended learning implementation strategy. Although this is a new process it is already clear that as long as deadlines and support is retained and the participants know what to do the will be a high degree of satisfaction, motivation, and creativity. It is therefore hoped that the implementation will be successful.

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DESIGNING AND DEVELOPING COURSES ON LITERACY AND COMPUTER INFORMATION LITERACY SKILLS

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Overview of LIBE Project (Supporting Lifelong Learning with Inquiry Based Education)

This contribution is built on an on-going research carried out by Rome Tre University during the first year of the LIBE project (Supporting Lifelong Learning with Inquiry Based Education). The project has been funded, within the Lifelong Learning Programme, by the Education, Audio-visual and Culture Executive Agency of the European Commission (project reference number 543058-LLP-1-2013-1-IT-KA3-KA3MP).

The consortium involved in LIBE is led by Roma Tre University and is composed by Lillehammer University College (Norway), University of Twente (The Netherlands), Birkbeck University of London (UK), Faculdade de Psicologia e de Ciências da Educação Universidade do Porto (Portugal).

LIBE project aims at offering young adults with low levels of education (16-24 years old) a set of personalized e-learning courses on transversal competences, i.e. literacy, numeracy and problem solving in technology-rich environments, in four languages (English, Italian, Norwegian, Portuguese).

Additionally, LIBE courses have a specific set of activities for the development of digital literacy, i.e. the capacity to retrieve, to access and to understand information available on the Internet for self-learning purposes, with a specific attention devoted to the learners' lexical profile improvement.

In details, LIBE e-learning courses intend to develop:

- A learner-focused approach, sensitive to modifying the pedagogical style of learning and nurturing an independent and innovative study through ICT in a lifelong learning perspective.
- A dispositive to modify learning object¹ contents, according to learner's lexical profile, in an automatized system. This system can be potentially used anytime without

¹ A Learning outcome describes significant and relevant learning goals that learners should achieve at the end of a course or a program. A key point in the definition is the possibility to demonstrate reliably that learning process was actually successful into a process perspective and not only on content-knowledge basis

tutoring and support costs and can, at the same time, be tailored to the specific educational needs of the users.

The aim is to engage young and young adults in short-term, adaptive, open access e-learning modules, in anonymity. Despite it can be hard to engage low educational achievers to learn without the direct personal contact with teachers and educators, the benefits of using distance education are several. Other than the flexibility guaranteed from asynchronous learning, there is the possibility of taking advantage from an individualized, non-competitive and highly differentiated formative assessment feedback, which will allow end-users to make the most from their learning experience.

Through the online courses, the young and young adults are expected to learn the basic literacy, numeracy and information processing skills in a web-based and technology-rich environment, requiring a proactive learner's involvement. Those skills are considered the most relevant to achieve the learners' ultimate goal of employment or to enrol in full-time education paths or training courses. This is why, on the one hand, a set of specific activities in LIBE courses are focused to foster specific job-related skills, such as writing a resume or understanding the requirements included in a job-description, or to use already available instruments such as EURES portal to seek for an occupation all over Europe.

On the other hand, the LIBE courses are conceptualized as a 'taster' learning experience that can further promote the engagement in long-term courses applications, both on e-learning and in face-to-face provision. The idea beyond LIBE courses is to concentrate e-learning activities on the use of internet as a powerful source of information and opportunity to effective self-regulated learning.

The present contribution will analyse in depth two courses (Learning Units – LUs) developed by Rome Tre University. The courses are related to literacy and computer information literacy and are aimed at improving learners' employability and digital skills.

In detail, this contribution highlights the strategies implemented in building these courses, i.e. the strategies to choose and adapt real life inputs retrieved from the Internet to low achievers learning knowledge and skills, and the procedures to integrate these inputs in the online virtual learning environment of the LIBE platform, with the dual goal to fulfil students' needs and to motivate their learning. Criticalities related to the cross-cultural differences arisen during the translation process from the English to the Italian version of the LUs are then discussed.

Two key concepts at the core of LIBE courses: literacy and computer information literacy

LIBE project is based on a theoretical framework that encompasses the definition of the general concepts at the core of the courses development. The definition of these concepts was

(Spady, 1994). Therefore, learning outcomes should represent essential knowledge, abilities, and skills, in terms of exit behaviours of the learning experience.

produced through the research review of important OECD, EU and IEA reports and documents (such as OECD-PISA, OECD-PIAAC, DeSeCo and IEA-ICILS²). The aim of the framework is to highlight the actual needs related to education and training for young and young adults (aged 16-24) in order to increase social equity, promote citizenship, improve employability and access to labour market at the European level.

Providing that this contribution is focused on literacy and computer information literacy, a general overview of the theoretical premises at the core of the project is limited to these two domains and encompasses the definitions of literacy, digital competence and computer information literacy.

For what concerns literacy, in the PIAAC 2013 report (OECD, 2013) it is defined as the “ability to understand, evaluate, use and engage with written texts to participate in society, to achieve one’s goals, and to develop one’s knowledge and potential. Literacy encompasses a range of skills from the decoding of written words and sentences to the comprehension, interpretation, and evaluation of complex texts. It does not, however, involve the production of text.”

Digital competence is instead viewed by Fessari (2012) as transversal, aiding the acquisition of other key competences. It is “the set of knowledge, skills, attitudes (thus including abilities, strategies, values and awareness) that are required when using ICT and digital media to perform tasks; solve problems; communicate; manage information; collaborate; create and share content; and build knowledge effectively, efficiently, appropriately, critically, creatively, autonomously, flexibly, ethically, reflectively for work, leisure, participation, learning, socialising, consuming, and empowerment” (EU-funded DIGCOMP project – see <http://is.jrc.ec.europa.eu/pages/EAP/DIGCOMP.html>).

The definition of Computer Information Literacy (CIL) provided in ICILS survey is strictly related to the one of digital competence, as states that “computer and information literacy refers to an individual’s ability to use computers to investigate, create, and communicate in order to participate effectively at home, at school, in the workplace, and in society” (Fraillon, Schulz & Ainley, 2012, p.18). This definition pursues the intent to connect it to previous definitions in the same field, such as those of media literacy and information literacy, and it is focused on the process of analysing and managing the information instead of limit its perspective to the outcome of it.

² According to the general structure of all IEA’s large assessment studies, ICILS aims at retrieving possible variations across countries in Computer Information Literacy achievement. Specifically it examines if and the extent to which the background factors can have an influence on students’ performances, both in terms of school contextual factors and in terms of students’ personal and social background, self-efficacy and habits in ICT use. Main survey was carried out in 2013 and the first international report was available in 2014.

The Learning Units related to literacy and computer information literacy: structure and content

LIBE courses are composed of 32 Multimedia Presentations (MPs) and 125 Learning Objects (LOs). All the learning materials produced in English were translated in the target groups' native languages (Italian, Norwegian, and Portuguese).

The present contribution concerns the development of the 63 learning objects related to literacy and computer information literacy by Roma Tre University. These LOs, that will be inserted in the LIBE Virtual Learning Environment (VLE) by fall 2015, are divided into two Learning Units (LUs). The first LU is exclusively focused on literacy, and the second one mainly concerns computer information literacy but also encompasses some activities related to literacy.

Each learning unit offers several lessons. Each lesson presents a similar structure:

- An introduction (that can include a short multimedia presentation, a dialogue or short text to read, images).
- A “Did you know...” section, in which the subject of the LO is explained in a synthetic and simple way and relevant examples are offered.
- A set of activities, strictly related to the explanatory section, devoted to train learners on the specific subject of the LO.

After completing each activity, students are given two kind of formative assessment feedbacks: the first one states the correct completion of the activity, while the second is generated when mistakes occur. In this latter case, the system can automatically show the students the correct answers compared to the answer given by the learner (in case of a single wrong answer, as in a multiple choice question for example) or alternatively, in case of an activity that can imply more wrong answers, the correct one is given, with a brief explanation about the strategies that should have been implemented in order to complete the task.

Each lesson of the LUs presents real life inputs retrieved from the web (such as resumes in the Europass format, authentic cover letters and job ads) that have been modified according to LIBE target group needs and knowledge. The lexicon is thus simple, the texts introduced are short and focused on relevant information, key words or aspects are duly stressed.

The first LU, titled “How to write a resume like a wizard”, is focused on employment issues and therefore examine in depth the composition of a resume and the strategies to write an effective CV and a cover letter, job ads' structures and show the potentiality of the Eures portal and of the Linkedin network to find job opportunities.

This LU is based on the adaptivity of the message offered to learners according to her/his lexical profile. It thus presents at the very beginning a short introductory cloze test that contains some of the target words described later on in the lessons. This test allows the modulation of the word meaning expansion according to the rules inserted in the system. On the basis of the results of the cloze test, in fact, the learning unit is modulated by the system,

that integrates the meaning of the target words in the LU texts with a pop-up containing a brief explanation.

The second LU, titled “Everything you want is out there waiting for you to ask”, concerns the computer information literacy domain and it is focused on digital competences related issues, such as for instance understanding how a search engine works, the basic commands of a browser, internet search results basic features, but also selecting a search string for retrieving information on Google, formulating a question with “What” or “Where” on a given topic, discriminating between reliable or unreliable online sources and identifying open and free online resources.

The structure of this LU encompasses a common section, made up of 9 LOs, where the students learn the basic principles and functions about the structure of internet and the search on the web. After this section, each learner is asked to select the general framework of the activities that will be later on proposed. According to his/her choice, the system will then offer the respective content related activity. This LU thus gives learners two different paths of learning that tackle the same basic issues, and differentiated only in terms of context, in order to encourage learners’ motivation and interest.

The general and ultimate aims of the courses developed by Roma Tre University are strictly related to the main goal of LIBE project: to empower learners with the knowledge and skills to engage fully in day-to-day demands of work and life events and to participate actively in a digital and more inclusive world.

Designing and developing of the LIBE Learning Units

After a recognition of the state of the art about e-learning platforms and electronic educational systems in general (Agrusti, 2014) it has been chosen to develop the LIBE Virtual Learning Environment (VLE) starting from Moodle, one of the most frequently used e-learning platforms (Rice, 2006). As stated by Graf and List (2005) Moodle “outperforms all other platforms and also obtained the best rating in the adaptation category” and it has been proved (Romero, Ventura & Garcia, 2008) that it is one of the most reliable source to obtain a vast amount of information to be used for analysing all kind of educational data (Mostow & Beck, 2006).

As regards to the LU developed by University of Roma TRE, the core of the development stage was related to the implementation of LU inside Moodle creating a specific sequencing pattern to obtain a mandatory learning path in order to guide the student during the course. The Moodle tools for creating activities allows a basic sequencing of them using the so called “completion status”. For each activity of the course, it was possible to obtain this status in three different ways:

1. The student has only to read/visualize the activity (i.e. a lecture or a video directly from the VLE).

2. The student need to obtain a specific grade to 'pass' the activity (usually a multiple choice test).
3. The student has to mark as completed the activity clicking on a specific button.

Once the activity has been completed it is possible to lock up the access to the following activities in the learning path. Given this structure, it has been chosen to automatically mark as completed an activity depending on its type: if it is a reading (i.e. "Did you know..." sections inside the LU) it was marked completed as soon as the student viewed it, in case it is a test, it was required a grade to pass the test and then to mark the activity as completed. Since this is only a method to block students but does not guide them into the learning path, it has been chosen to develop special buttons at the end of each activity to allow the student to jump directly to the next activity in his/her learning path. These buttons allows the students to go back to the previous activity (if it is possible in the LU design) in order to re-take a reading or a test.

In some of the LU, it has been proposed to the student a specific branching system: at certain point of the lesson, the student can choose to follow an activity instead of another. In this way, it is possible for the student to take different branches inside the same main container (the 'lesson'). After some activities (a reading and a test), the two different branches are re-joining together into the same learning path. This allows us to obtain a particular adaptive sequencing based on the students' choices.

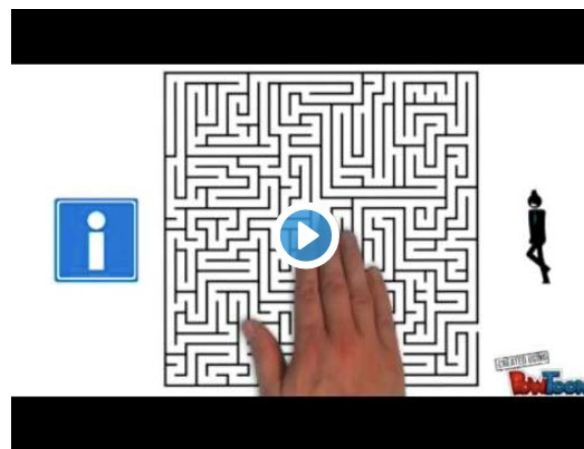


Figure 1. A captured frame of a LIBE Multimedia Presentation

To develop the LIBE courses Multimedia Presentations (MPs) short videos were created in order to introduce the LOs or to give more details in certain crucial point of the lesson. To make the student watch the video entirely has been created a *script* in *javascript language* in order to be sure that the video playing is effective: the button to pass to the next activity is not showed until the video has ended is playing. Even if this does not provide actual information on the attention levels of the students during the video, this prevents the student from skipping the MP to reach the next activity.

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Authors

The section 1, 2 and 3 has been written and edited by Valeria Damiani, the section 4 has been written and edited by Francesco Agrusti.



INTERNATIONAL VIRTUAL MOBILITIES FOR OPENING UP EDUCATION

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Introduction

As new technologies are introduced into educational environments, they influence educational paradigms, methods and delivery. When free and open source software effect these disruptive technologies, there is an impact on higher education systems, resulting in a profound impact on how students learn. The Internet, the Web, and Web 2.0 technologies are the biggest examples of recent disruptive technologies. The Internet has changed the way people communicate and share information. The Web has made knowledge become omnipresent. Web 2.0 technologies enabled users to create knowledge which becomes ubiquitous.

Many of the online tools that students use in their daily lives are making their way into the classroom to foster the development of digital literacy skills (Schoffner, 2013). Several innovative ideas to foster the use of ICT and the development of digital literacy skills. The concept of virtual mobility can be defined as a set of ICT supported activities that realise or facilitate international, collaborative experiences in a context of teaching and/or learning it. Since 2008, the authors have offered TalkTech, an online collaboration enabling students from their universities to research technology trends, share their experiences, and create multimedia objects to present their findings (Frydenberg & Andone, 2010). As members of international teams, they must produce a viable digital media product created working with international partners located on another continent. Throughout the six-week project they must select appropriate digital tools to support with their communication and collaboration efforts, manage time zones and technologies, and track their progress. The purpose of this collaborative project is to create a controlled work environment which models the global enterprise, where the use of web-based collaboration and communication tools are commonplace. The analysis in this paper will show how this project supports Wheeler's characteristics of digital literacy (Wheeler, 2012).

TalkTech 2014 Project Description

The TalkTech 2014 project matches first year business students in IT 101, an introduction to technology concepts course at Bentley University, a business university in the United States, and Bachelor in Telecommunications engineering students in the Technologies of Multimedia (TMM) course in their final year at Politehnica University of Timisoara in Romania. 45 American and 55 Romanian students participated in the TalkTech 2014 project. All of the students who participated spoke English with fluency. The Romanians were about 4 years older than American partners – average age 22 years old versus 19 years old.

Both IT 101 and TMM teach students basic digital literacy skills, including creating and posting videos, making personal web pages, interacting with social networking sites, and using a search engine as a research tool. Students also learn to develop new media and use Internet technologies for communication and collaboration. The TalkTech project give students the opportunity to develop and demonstrate their skills in these areas, as they must become facile with creating, consuming, posting, and embedding multimedia, using the web as a research tool, and communicating online using appropriate methods. Many of the tasks involved creating audio or video clips in which students from both countries participated simultaneously. Students needed to rely upon their own knowledge, experience, or research to find appropriate methods to complete these tasks without recommendations from their instructors.

Students formed groups of three or four by selecting a topic. Each group worked together for a period of six weeks to research the topic, and share their findings in an interactive infographic. Students met with their international partners over this period both synchronously (using voice, video, and chat) and asynchronously (via e-mail, forums and blogs) to share their research on these popular technology trends. The instructors' input was minimal, providing general supervision to make sure the students were actively working together to meet project milestones. The instructors asked students to use the blog and file sharing capabilities of ViCaDiS (Vasiu & Andone, 2011), a customized virtual campus application with blogging and file sharing capabilities for each group to promote team collaboration. Many students also used familiar social and digital media tools for collaboration. Table 1 shows the topics chosen for TalkTech 2014, all of which are current technology trends of interest to digital students.

Table 1: TalkTech 2014 topics

Technology Trends Topics for 2014			
1	3D Printing	8	Mobile Payments
2	Augmented Reality	9	Open Data
3	Big Data	10	Privacy
4	BitCoin	11	The Internet of Things
5	Creative Commons	12	Video Streaming
6	Crowd Sourcing	13	Voice Recognition
7	Event Planning	14	Wearable Devices

The deliverable for this project is an interactive infographic created using ThingLink. Educators have used ThingLink and other web applications in the classroom in assignments to develop higher order thinking skills. (Schoffner, 2013) A content curation tool, educators introduce ThingLink in the classroom to have students create interactive maps, reports, images, and stories. To create a ThingLink, users select a background image, place markers on it, and annotate those markers with audio, video, images, hyperlinks, or text. A project requirement was to create audio and video content showing at least one American student and at least one Romanian student in real-time conversation, discussing some aspect of the topic. Students posted links to their completed ThingLinks on their personal websites, as well as to their accounts on Facebook and Twitter. Text annotations were prepared in each student's native language, and then translated using Google Translate. Students created their own original background images for their ThingLink graphics. Their resulting ThingLinks showed creativity, appropriate research skills using online tools, and a command of several web based collaboration, communication, and multimedia creation tools to create highly visual and engaging presentations, such as that shown in Figure 1. ThingLink on the Internet of Things; text annotation translated using Google Translate., on the topic of The Internet of Things.

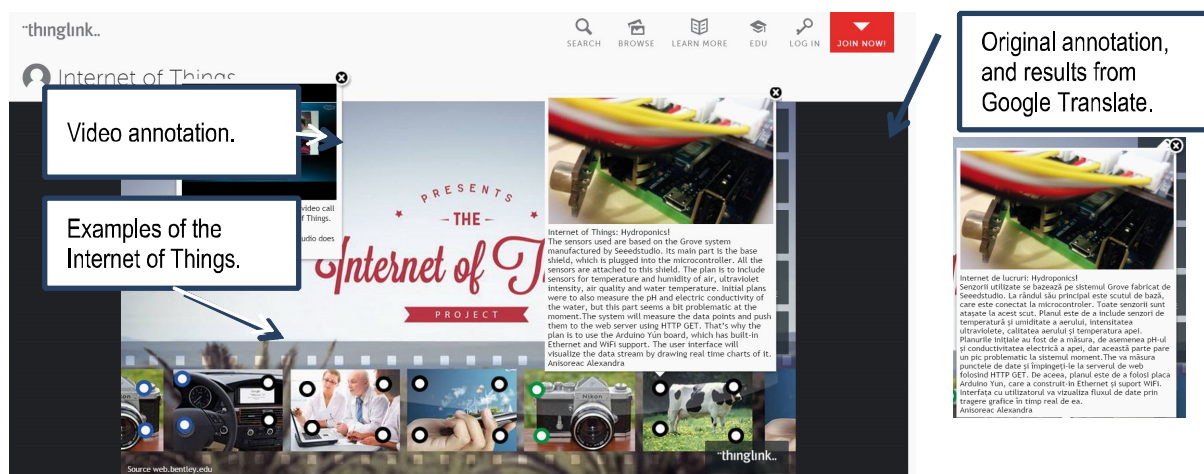


Figure 1. ThingLink on the Internet of Things; text annotation translated using Google Translate

Analysis

The project evaluation looked to study to the guiding questions, to see how students were able to develop their digital literacy skills, the tools they chose, and the challenges they faced. The instructors also wanted to ascertain the variety of approaches that students would come up with to solve these problems. This study used several evaluation methods. The authors relied on interviews and usage data to gather an impression of how students interacted with and used open personal learning environment created on ViCaDiS. In addition to the usage data, students voluntarily completed an anonymous online questionnaire based on the ZEF method (www.zef.fi). The survey was combined with two open questions: 'list two difficulties you faced in completing this project and how/if you overcame them' and 'list the two most important things you've learned'. Both studies are qualitative and are intended to guide possible future education methods rather than to claim the value of the tools used. To evaluate

the students' work for a course grade, both instructors independently graded each group's project. Grades were based on technologies used, evidence of documentation of the process on the group's Blog on VICADIS, and quality and accuracy of content presented in the interactive ThingLink infographic. The instructors shared their evaluations with each other, and then determined final grades for their own students.

Use of Technology

Figure 2 summarizes the technology tools students used, and the percentage of students from each university who claimed to use them as part of their work on the TalkTech project. It is encouraging to find that their experiences were reasonably consistent in the use of most of these tools.

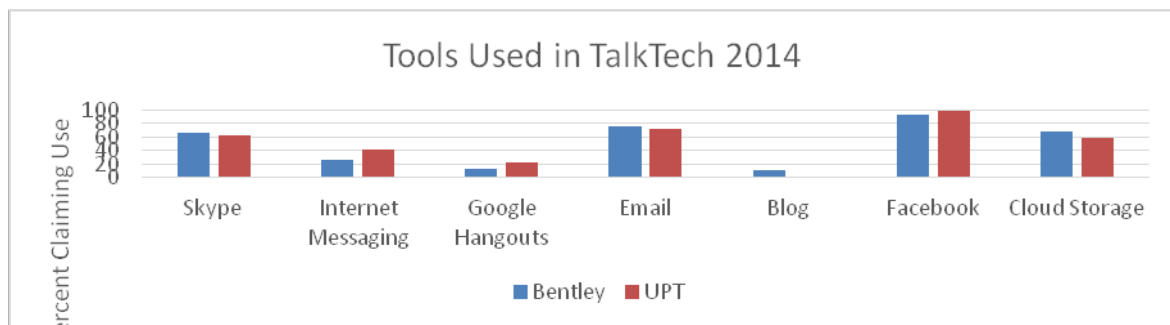


Figure 2. Technology Tools used in TalkTech 2014

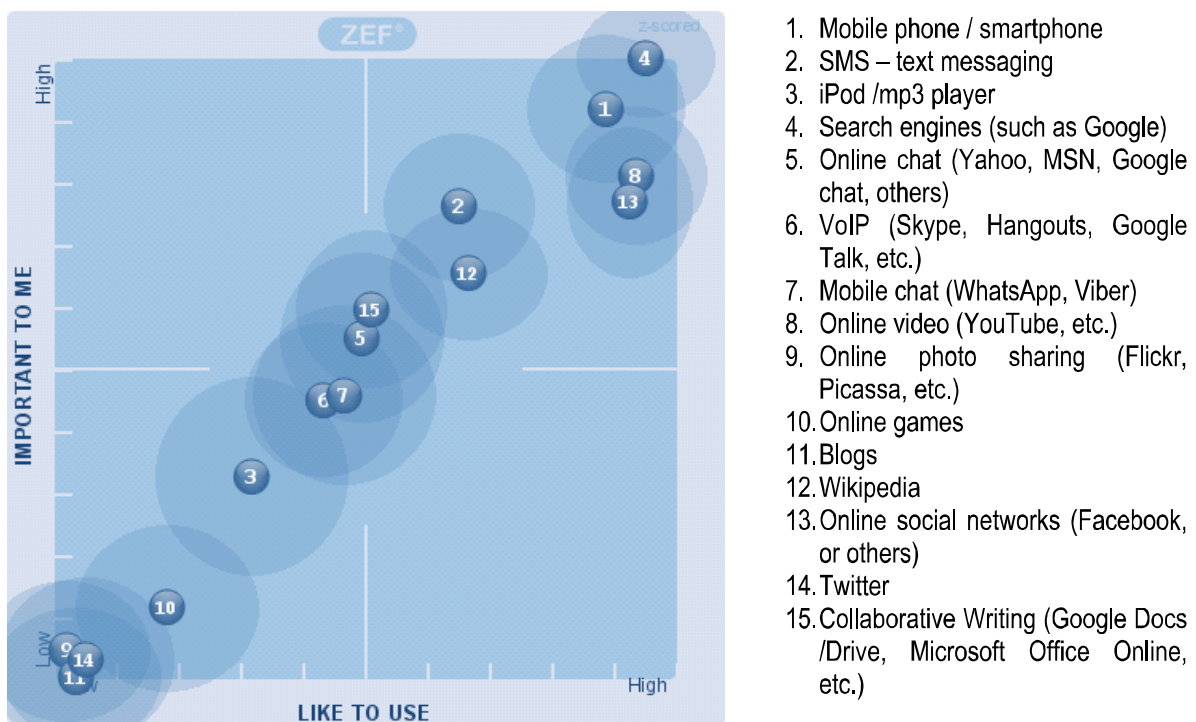


Figure 3. Student attitude toward technologies used in TalkTech 2014

The students' use of different technologies for communication during the project was dependent on the task to be performed, the project timing (they used more email at the beginning and more social media tools towards the end of the project), and the tasks they

needed to accomplish. They used their smartphones for working together, recording the videos, and holding online live communications. Figure 3 shows the technologies they like to use, and those that are important to them.

Regarding their use of Skype, some students commented that it is “a valuable tool when trying to communicate...” but recognized that it is “important to have a good internet connection when talking internationally.” Most had not used Skype previously to record conversations. Several students reported that both Skype and Google Hangouts were “problematic at times.” Few students considered their use of the ViCaDiS blog as using a blog, even though all students were required to post their project milestones to it.

Virtual mobility analysis

We considered that TalkTech 2014 project (as well as the previous ones since 2008) are international virtual mobilities, with a strong focus on developing digital literacy skills, communication skills, multicultural abilities and entrepreneurial perspectives.

Communication skills

Attitudes toward email as a communication media among participants was mixed. Of the 78 students responding to the question about their use of email, 21% of the participants remarked “we never really emailed,” or “not much email was exchanged” beyond making initial contact. The majority (62%) who used email limited their discussions to organizational purposes, such as sharing other forms of contact information, setting meeting dates, or to report when each group member finished his or her assigned tasks. 2% of the students remarked that their groups used email to get to know their group members better and talk about their cultural differences: “I think the two most important things that we discussed [via email] were student’s lives in Romania, and how we would work on this project collaboratively.”

Social Media

Several group resorted to using Facebook over ViCaDiS to hold their group discussions because it has a more familiar, ubiquitous presence in their lives. Because they chose to create a Facebook group page rather than using ViCaDiS as their preferred communication channel, the instructors believe that participants worked more cohesively together. While the instructors requested that the students post regularly to ViCaDiS, it became clear that comments on the Facebook group page provided a much more complete record of a group’s rhythms over those that simply used ViCaDiS. Their posts were written while working on the project with their group members, not as an after-thought for their instructors to read. To meet project requirements, groups that chose to use Facebook also provided occasional milestones to ViCaDiS, and made their group’s Facebook page public so the instructors could view their progress throughout the project.

Conclusion

Today's information society demands digital literacy in order for citizens to be active contributors in the workplace and in the world. The TalkTech 2014 project modelled a global workplace where students developed and applied their digital literacy skills using web-based technologies to interact with their peers across continents. Students extended their personal experiences with using social media and other technology tools by applying them in an educational/professional context. In doing so, they gained new understanding of the power of their tools or technologies of choice for efficient and effective communication and collaboration.

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FLIPPED CLASSROOM: ADVANTAGES AND DISADVANTAGES OF APPLICATION OF THE FLIPPED CLASSROOM

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Introduction

The present work falls within the network group ALEN (Active Learning Educational Networking) formed by different members of the educational community with long professional experience. This research focuses on understanding and evaluating the point of view of the students regarding the Flipped Classroom in order to be able to assess how the learning, and also the strengths and weaknesses of this methodology are perceived by them. This network is within the research group ARGET of educational technology at the University Rovira and Virgili.

ALEN group has as main objective to create a network of national and international professionals with the world of education, with the aim of introducing new active methodologies and disseminate them, and to spread the experience of the project of research and experimentation.

Concerning research the focus is on three points. Firstly, improvement of the results by comparing them with other subjects or topics made with different methodology. Secondly, observation what happens during the process. Thirdly, the point of view of the student regarding the strong and weak points with respect to other methodologies.

The Flipped Classroom

The Flipped Classroom (FC), is the result of the experiences of professors of chemistry at Woodland Park High School, Colorado. They noted that their students lost many theoretical classes due to their commitment to sports practice and the subsequent implied setbacks. After they discovered a software with which they could edit presentations and transform them into online videos, they decided to turn around the contents of their educational lessons in the classroom (Westerberg, 2012). The fact that the students could visualize the theoretical sections of the subject at home, or anywhere else, allowed devoting more time to the students in the classroom itself, one hand, to what the students had seen in the videos online, and on the other, to any doubts or questions that arose. In addition, they were able to carry out, more specific work and more specific tasks that the students would normally perform at home through means of homework. (Bergman & Sams, 2012). Being able to perform these activities

in the classroom allowed them as teachers the possibility to dedicate much more time to the students and solve any queries they had, not in the theoretical section, rather in the practical field, allowing the students to obtain a higher degree of understanding of the content (Tucker, 2012). More research has also stressed that the methodology of the FC allows the students to improve their academic performance, motivation and involvement, thus improving the critical thinking of the student. In addition, their collaboration and cooperation among equals aids the students' ability to be able to learn from one another (Bergman & Sams, 2012; Strayer, 2007). But not only is this methodology beneficiary for the student: other resources have shown that the FC improves teacher – student interaction, improving the behaviour of the student in the classroom (Flumerfelt & Green, 2013) and, an increase in student participation, can enable improvement in their performance (Wilson, 2013).

Description of the research

The research focuses on the experience of the student. Once you have carried out FC sessions with the students, they complete a questionnaire to evaluate the items on which the Flipped Classrooms are based: the materials proposed by the teacher, the classroom activity, the role between classmates and finally, the role with the professor. Participating teachers in the Sessions Flip or not Flip, organized by the ALEN Working Group, are trained in this methodology through lectures and presentations of experiences, in addition to training workshops. Once they have done these sessions, the teachers put the methodology into practice with their students, and then gave their pupils the questionnaire so that they can assess the experience. By collecting data from the questionnaire, the methodology can be evaluated and conclusions extracted in order to be able to identify positive and negative aspects for students, as well as the evaluation and analysis of the items discussed above.

Different research results about FC have shown improved academic performance of students, their motivation and their involvement, improving student critical thinking, collaboration and cooperation between equals and how to learn student (Bergman & Sams, 2012; Strayer, 2007). This methodology, not only shows benefits in the acquisition of learning, but that they also promote a more committed, emotional learning and behaviour, the cognitive challenges, enjoying the learning process, showing a greater involvement in interventions in the classroom, thanks to increased interest from students by the teaching material proposed by the teacher (Jamaludin & Osman 2014).

The field that presents the proposal of improvement, is focused on the methodological application of the FC on different subjects and different educational stages. These applications are made by some teachers attending the Conference called Flip or not to flip, proposed by the Working Group of ALEN and made on April of 2015 in Tarragona, Spain.

Teaching based on the improvement by the FC, is based on the use of time in the classroom with students, work more practical than theoretical, which favour the acquisition of knowledge in a more meaningful way. In this way one can move the passive reception of the content by the student to rather being able to work with them in the classroom, through small

groups, discussions or practical tasks, concepts that have assimilated through materials submitted by the teacher, thanks to the new technologies. As detailed in the pedagogical work ALEN group basis, a recent study (Ali, Ghazi, Shadzad & Khan, 2010) has shown that collaborative spaces, where classrooms and student desks are organized in such way that facilitate discussions in small groups, and that students have the chance to explore their own ideas promotes learning and the improvement of results. This theory, also rests with the cone of Dale (1968), where he says that students remember 20% of things that explain them but can remember 90% of the things that can be done.

These days, proposed teaching attendees participate in a study of the application of the method of the FC, in order to verify and analyse the result of this implementation in schools, in the process of teaching and learning. The research focuses on the experience of the student. Once made FC sessions with students, they perform a questionnaire to assess some items based on FC concerning the materials proposed by teachers, activity in the classroom, the role between colleagues and the role with the teacher.

Finally, teachers, put into practice the methodology with students in the classroom, by modifying standard in its sessions, the Flipped Classroom methodology. Subsequently, once after the various sessions by which the didactic unit raised was composed, teachers give students a questionnaire online to be able to assess the experience as well as the items raised. Through the collection of data, the questionnaire created by researchers and members belonging to the Group of work ALEN, it values and the conclusions are extracted to identify positive and negative aspects to the students in the implementation of this methodology, as well as the assessment and analysis of the items previously exposed.

CAPACITY DEVELOPMENT FOR E-LEARNING – EDUCATIONAL STRATEGIES AT MID SWEDEN UNIVERSITIES

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This paper aims to explore the capacity development for e-learning at Mid Sweden University since launching an educational strategy in 2011. Through a study of five e-learning model projects it can be stated that the strategy has strengthened the capacity development for e-learning at the university. Technology has been further integrated into other key components of learning, namely pedagogy, communication and organizational systems.¹

Introduction

In October 2010, Mid Sweden University introduced an educational strategy (Dnr MIUN 2009/1671), in which e-learning was one of two priority areas for strategic development between 2011-2015. The goal was that Mid Sweden University would be recognized as successful in e-learning in comparison with other universities and that e-learning should be included at all levels of education, both online and on campus. According to the strategy, Mid Sweden University would be active in developing forms and methods for e-learning. The goal would be reached through following five steps:

1. developing a policy and action plan for e-learning;
2. strengthening teachers' professionalism in e-learning;
3. building a common resource for media production;
4. establishing a university-wide technology platform for e-learning;
5. expanding research in e-learning (Reg MIUN 2009/1671).

As a part of this process, different academic subjects and departments started innovative projects of a model character, in which different approaches to education and e-learning were developed, tested, and evaluated. In the end, these projects would be implemented on a whole university scale (brochure Educational Strategy, MIUN 2012). A number of other projects in e-learning were also initiated and a new learning management system was installed in the fall of 2012. The Learning Resource Centre (LRC), the central unit for e-learning support, was involved in drawing the lines for an e-learning policy and action plan. This plan was intended to build on the quality criteria for e-learning presented by The Swedish Higher Education Agency in 2008 (SNAHE, 2008). In the action plan the resources needed for e-learning in

¹ Parts of this paper have been presented at ICED Conference in Stockholm, June 2014, and at NU2014 in Umeå, October 2014.

form of teacher time and competencies, requirements for technical and educational support, as well as other aspects of infrastructure were highlighted. The introduction of the educational strategy was thus an important step in developing internal capacities for e-learning, opening up for both institutional and cultural change at the university. But how did these changes appear?

This paper aims to examine the effects of the educational strategy on capacity development for e-learning at Mid Sweden University. Four years have passed since the strategy was introduced, and five “model projects” have been implemented during that time. In which ways have these five projects helped to shape the capacity development for e-learning at Mid Sweden University? This question is relevant when studying sustainable and long lasting effects on educational development, since it sheds light on how strategic efforts can affect the organization at individual, group and organizational level.

Theoretical assumptions

Capacity development can be understood as a process in which individuals, groups and organizations strengthen their ability to cope development towards a particular goal (Horton, 2002; Gunn, 2007; Bjorkman, 2008; Mitchell & Sackney, 2011). According to Horton (2002), capacity development is an internal process of development that is controlled by the organization’s goals. In this context, capacity development may thus be seen as the process by which individual employees and departments at Mid Sweden University develop their ability to manage and improve a learning environment that is permeated by e-learning. The development aims at the strategic objectives mentioned above.

Which aspects are then important to focus on, when studying capacity development and possible change in higher education? Björkman (2008, p.38) has summarized and discussed research regarding internal capacity development in his thesis on the development of primary school in the Swedish context. He shows that teachers’ knowledge and skills, cooperation and communication, as well as organizational structure and culture, are reoccurring and important themes in the research concerning capacity development. Resources and technology also play an important role, as well as leadership. Since this article is about capacity development for e-learning, technical development and how it is integrated into the organization, are obviously important. We thus need to select themes that relate specifically to e-learning.

According to Snyder (2007), *pedagogical methods, communication, technology and organizational systems* are the main components of a digital culture for learning. These components are integrated rather than kept apart, thus learning becomes a dynamic process where human interaction is of great importance. The creation of a digital culture therefore includes much more than introducing new technologies in education. It is about facilitating learning in a social context with help of new technology. Keller and Lindh (2011) show similar findings concerning successful strategies for e-learning. They argue that digital competence, suitable pedagogical methods, technology, and positive organizational culture are of great

importance in conducting online education of good quality. The authors also highlight, as does Snyder, the importance of creating learning communities, where communication and cooperation are encouraged. Thus, the four components of digital culture – education, communication, technology and organizational systems – are selected here as important themes when studying the development of capacities for e-learning.

Methodological issues

The empirical data in this paper consist of five project reports and five interviews. The model projects are described in specific project reports and two of them (Blended Learning and MUML) have also been presented at different conferences (Barthelson et al., 2013; Jaldemark & Lindberg, 2014). In addition to this, interviews were conducted with the key persons of the projects.

The five model projects are the following:

1. Blended learning at the Department of Engineering and Sustainable Development;
2. E-learning methods at the Department of Social Sciences;
3. Courses in E-Learning (Higher Education and Learning Technology Enhancement, HEALTH);
4. Frontdesk at the Department of Information and Communication Systems;
5. Mid Sweden University and Mobile Learning (MUML) at the Department of Education and the Department of Information and Communication Systems.

The study is inspired by Miles and Huber's (1994) method of content analysis of qualitative data, where the content is coded and grouped under specific themes. Here, the content analysis has a deductive approach and focuses on the four aspects/themes that are considered important for capacity development for e-learning (education, communication, technology and organization). How are these themes highlighted in the project reports and the interviews? What new e-learning tools, methods, communication tools, and organizational models have been introduced at the Mid Sweden University since 2011 and how has this contributed to the capacity development for e-learning at individual, group, and organizational levels?

Findings

The analysis shows that the launching of the educational strategy has contributed to the capacity development for e-learning in several ways. Individual employees and departments at Mid Sweden University have developed their ability to manage and enhance a learning environment that is permeated by e-learning. All four components that were selected as specific themes for this study – technology, pedagogy, communication, and organization – are more or less integrated in the process.

First, several of the projects developed new educational methods for e-learning that involve new technology. An example of this is the blended learning project (No 1), where online learning takes place in parallel with campus learning. Classrooms have been equipped with technology that supports these new methods. Blended learning is now implemented as a method at several departments at the university.

The model project on mobile learning (project No 5) has led to development of the university's learning management system Moodle. The system is now adapted for mobile devices, and mobile devices are actively used in certain courses. The pedagogical and technological development have also influenced and broadened communication between teachers and students. However, the use of mobile devices and mobile learning has not have any larger effect on the organization. It can thus be concluded that capacity development occurred in regard to at least three of the four themes - technology, pedagogy and communication – and that there is room for more changes and capacity development in these two areas (i.e., blended learning and mobile learning) within the university.

The model project for e-learning methods at the Department of Social Sciences (No 2) clearly shows that capacity development for e-learning takes place on several levels. The implementation of a frontend has resulted in changes and improvements in communicational, technological, and organizational systems, while the various discipline-specific subprojects yielded results especially in pedagogy and communication within the courses. Several teachers also learned new techniques for video recordings and for teaching online in the LMS. The teachers' professionalism has thus been strengthened by the project.

Another important part of capacity development has been the implementation of a case management system for faculties, which started by the model project No 4. This has contributed to major changes in the university's organizational system where the creation of a university wide service center is central. In parallel to this, LRC is leading a project called "E-campus", which aims to creating of a functioning online campus, where students have the same access to service, support and communication as at the physical campuses. In this project, the organizational change was thus more evident than in the other model projects.

One of the model projects (project No 3) involved the development of an academic structure for e-learning through the establishment of a masters programme and a graduate school in e-learning (Jaldemark & Snyder, 2012). This project was unfortunately not carried out, partly due to formal issues regarding admission.

According to both Horton (2002) and Gunn (2007), it is important that not only the individual capacities are developed – the development must occur at all levels. Gunn (2007) argue that attitudes within the organization need to be changed and that the resources need to be spread out in an intelligent manner. Similarly, Mitchell and Sackney (2011) speak of three integrated tracks or levels for capacity development; individual, group and organizational such. The results of this study clearly show that changes and development processes have occurred both at the individual (teacher) level and group (department) level, but also at an

organizational, university-wide level. But as Barthelson et al. (2013) argue, the commitment must always come from the top. It is not enough nor acceptable that individual enthusiastic teachers pull the entire load. Decisions and efforts by the management are required for capacity development to take place and for the goals to be achieved. There must be time and space for cooperation and development of new methods and practices, and this often requires more hours of the teachers' work. Within the framework of these five model projects, there have been resources in terms of time and new technology, but when the projects came to an end the lack of time returned as a constant problem. This implies that the management should increase its efforts, to change the organization so that teachers would get more space for their individual capacity development and course development, which in turn can enhance the quality and sustainability of university education in whole.

Summary and conclusion

In conclusion, the educational strategy for e-learning and the five model projects have contributed to both cultural and structural change at Mid Sweden University. The capacity development for e-learning has been stimulated and the preconditions for achieving educational objectives of the strategy has been strengthened by the introduction of new technologies, pedagogical methods, communicational, and organizational systems. Capacity development has occurred on several levels within the organization and the four studied themes are highly integrated with each other. The most obvious changes have occurred within the departments that participated in the projects, and the administration, where the frontend function (case management system) was introduced. It remains to be seen whether and to what extent four of these model projects will be applied to other parts of the university. University management's role will be crucial in this matter.

To get a comprehensive picture of how well the objectives of the strategy for e-learning have been achieved, and what other changes have occurred since the adoption of the strategy, more studies would be needed. It would be interesting to analyze several projects initiated in the wake of the strategy, for example a project concerning media production and another on the above mentioned creation of an e-campus. LRC's work should be analyzed in more detail to see how the central unit for learning support contribute to capacity development for e-learning. Several types of sources would be needed, such as evaluations and more interviews, to see how well the projects are followed up and how well they have achieved their goals. This will be the focus of future studies on e-learning at Mid Sweden University.

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EFFECTIVE LEARNING STRATEGIES: MAKING SENSE OF AND WITH LEARNING BY MEANS OF B²R²SDL³ AND S2S

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Abstract

The goal of teaching any subject or course is not merely to get students to master current content and skills, but to develop students to become self-directed lifelong learners who can continue to update and even lead the field they choose to navigate. The reality is, however, that students do not know how to study properly, or they use study strategies that are ineffective, such as rote learning, underlining, rereading and massed practice. This is the case, in spite of current and reliable research showing us how to learn effectively. In this paper, an overview will be given of the latest research by neuro- and cognitive scientists on how our minds want to learn, what study strategies are actually effective, and how lecturers and educators can teach in ways that develop these crucial skills as part and parcel of teaching content. Attention will also be given to how the research can be put into practice and how we can teach learners to develop Learning Minds and to study effectively.

A project called Study 2 Succeed (**S2S**) was launched at the University of South Africa to support students by enhancing their learning and studying capacities, focussing on seven aspects crucial for studying effectively – Self-knowledge, Focus, Listening, Reading, Memorising, Performing and Application skills. These are universal skills to be used by all learners and students in ways that recognise their individuality and uniqueness.

To evaluate the program, a group of third and fourth year medical and dental students participated voluntarily in a pilot project. Their study habits and strategies were evaluated, after which they followed the Study 2 Succeed program. This was followed by six cooperative learning sessions where they applied the program while preparing for tests and exams.

At the end of the intervention the participants evaluated the usefulness of the Study 2 Succeed program, and their performance was compared to previous results in tests and exams.

Attention was given to how students with similar abilities appropriated universal learning and study strategies in unique ways. The results have implications for how lecturers should teach subject content in ways that also develop the ability to master content, both in face-to-face and in distance education settings.

In short, learning (and teaching) should heed the formula **B²R²SDL³**: it should be Brain-based, Reality Related, Self-Directed Life-Long Learning. Each of these aspects will be discussed.

Extended description

Research questions

As a neuro-education practitioner, many students contact me for assistance with study strategies. Based on my experience I suggest that students often use ineffective study strategies. This is the case even with well-performing students enrolled for challenging courses such as Medicine, Dentistry, Veterinary Science, Actuarial Studies and students studying for their Chartered Accounting qualification. As a result of this, I have evaluated, used and tested study strategies based on recent and current cognitive and neuro-educational research, and I have developed a program called S2S aimed at instilling new study habits which are well-founded as well as practical and useable in real life study circumstances.

Anecdotal evidence, however, needs to be translated into scientific terms, and therefore the following research questions have been posed:

6. What does neuro-educational research say about study strategies – which strategies are effective and which are not?
7. How do students study – what strategies do they use, how effective are they, how aware and how satisfied are the students about their own study strategies?
8. What is the effect of the S2S study strategy intervention program on the awareness about, use of and performance as the result of study strategies used by students?

This article / paper is an interim report on the process, outcomes and findings of an action-based research process where 10 Medical and Dentistry students followed the 6 week S2S program on Effective Study Strategies.

Research question 1:

What does neuro-educational research say about study strategies?

In order to answer the question regarding research on study strategies, a literature review has been done.

The review indicated that students often use ineffective study strategies. Students do not know how to learn, and in spite of new insights in how brains learn, they still use highly inefficient, ineffective and even harmful learning strategies and habits (Doyle & Zakrajsek, 2013, p.1). Even good students such as medical students struggle to learn effectively (Brown, Roediger & McDaniel, 2014, p.ix). A reason for this is that, while at school, learners are often coached to pass instead of guided to learn and study independently (Zohar, 1999; Vrugt & Oort, 2008).

Recent developments in the neuro- and cognitive sciences yielded dependable results about how humans could learn and study efficiently. Even so, many ideas that could be described as “neuromyths” still continues to dominate popular and even academic education publications (Hardiman, 2012, pp.6-11). Emerging research in cognitive psychology and neuroscience is

lending credible insight into how people learn, but teaching on most college campuses has not changed much, and faculty members still teach according to habits and hunches (Berret, 2012).

Dunlosky et al. (2013) evaluated 10 often used study strategies as to their relative utility. In the process they evaluated the benefits of the ten study strategies across four categories of variables, namely learning conditions, student characteristics, materials and criterion tasks. The ten strategies are Practice testing, Distributed practice, Elaborative interrogation, Self-explanation, Interleaved practice, Rereading, Highlighting / underlining, Summarization, Keyword mnemonic and Imagery for text. They found that the strategies used most often are reading and rereading, summaries and massed practice. They also found these were the most ineffective study strategies. The most effective strategies were found to be Practice testing, Distributed practice and Elaborative interrogation, with Self-explanation, and Interleaved practice showing some promise but in need of more research (Dunlosky et al., 2013).

Research and knowledge about effective and ineffective study strategies are out there, but do not reach learners and students. This poses a second question, namely how do students study and why do they use the strategies that they use?

Research question 2:

How do students study?

To understand how students actually study, a group of third and fourth year medical and dental students participated voluntarily in a pilot project. Their study habits and strategies were evaluated, after which they followed the Study 2 Succeed program where they applied the program while preparing for tests and exams. These students had to perform exceptionally well at school in order to be admitted to their respective courses, and should therefore be good learners. Even so, they all indicated that studying was cumbersome and not a pleasure.

In order to answer the question about how students actually study, interviews were conducted with each of the students regarding the study strategies they use. The ten strategies mentioned by Dunlosky et al. (2013) were enquired about, as well as others that were not mentioned in their list.

From the interviews it was established that most of the students did make use of ineffective strategies. That leads to cumbersome and long study hours with results not reflected in their results. That often lead to dejection and impacted negatively on motivation as well as on the experience of subjective well-being and the experience of meaning in life.

Some did perform well in spite of using ineffective study strategies, most probably as the result of sheer brain power and superior intelligence. Even so, study was not experienced as an enjoyable activity.

Some students did use some of the more effective study strategies, or versions of them. These students, however, were not taught these strategies in school or at university, but stumbled upon them by chance.

It is clear that students, even good students, are in need of being taught which study strategies are effective and which are not, in order to begin using the effective ones and to let go of ineffective strategies.

Research question 3:

What is the effect of the S2S study strategy intervention program on the awareness about, use of and performance as the result of study strategies used by students?

An intervention program called **Study 2 Succeed⁵⁷ (S2S⁵⁷)** has been developed by Prof. Ignatius Gous from the University of South Africa. Based on recent well-researched and dependable Neuro-Educational research, it translated neuro-educational theory into practical strategies, addressing seven critical aspects of learning.

Study strategies are actually complex sets of habits, formed over time and as such are stable and difficult to change. In order to develop new habits with effective strategies, a single exposure will rarely lead to long term change. The **S2S⁵⁷** program, however, introduces students to seven foundational aspects of effective life-long learning habits, namely Self-knowledge and Mindset, Focus and Grit, Listening, Reading, Memorising, Performing and Applying skills. It is done for 57 days in manageable and practical chunks (about 20 minutes per day), delivered electronically to smartphones, tablets or computers. The reality is that these skills are seldom taught or being taught continuously, with listening being taught the least of all (Halone, Wolvin & Coakley, 1997; Janusik, 2002; Ottenhoff, 2011).

At the end of the intervention the participants evaluated the usefulness of the **Study 2 Succeed⁵⁷ (S2S⁵⁷)** program, and their performance in tests was compared to previous results in tests. Attention was given to how students with similar abilities appropriated universal learning and study strategies in unique ways.

The effect of the intervention was positive. Students experienced learning as “easier” and “more fun”, as well as “making it easier to relate what I study to what I have to do in practice”. “Binge learning” or the memorising of huge amounts of basic knowledge and facts as is necessary for studying Medicine and Dentistry were handled with more ease.

Test results showed a positive trend. In some tests students performed 15 to 20% better than their average the previous year. Other students performed better than the class average while they usually were below class average. Although it is impossible to control all variables in educational settings (as is being made clear in Design Based Research Methodology, see Barab & Squire, 2004; Sandoval & Bell, 2004; The Design Based Research Collective, 2003; and Anderson & Shattuck 2012), it does seem that the program is contributing to more effective study strategies, or at least a more positive attitude by students towards learning and studying.

With the right kind of support, students can develop healthy study habits using effective study strategies, and in the process become self-directed lifelong learners (Ridley et al., 1992).

Conclusion

Learning (and teaching) should heed the formula **B²R²SDL³**: it should be Brain-based, Reality Related, Self-Directed Life-Long Learning. Each of these aspects will be discussed.

B²R²SDL³ = Brain-based, Reality Related, Self-Directed Life-Long Learning

S2S = a project called Study 2 Succeed

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ENHANCING 21ST CENTURY SKILLS AND PROMOTING SELF ASSESSMENT AND REFLECTION IN A BLENDED LEARNING SETTING

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Introduction

During the last academic year (2013-14), we started the implementation of a brand new blended learning concept in the bachelor's nursing course in VIVES Roeselare. With this concept, we aim to meet the fundamentally different demands made on employees and thereby on higher education by today's knowledge and innovation society.

In this paper we present the fundamentals of our blended learning concept and the results of an enquiry among the students about their preferences and needs for learning concerning digital tools and social media.

Theoretical framework

"I'm calling on our nation... to develop standards and assessments that don't simply measure whether students can fill in a bubble on a test, but whether they possess 21st century skills like problem-solving and critical thinking and entrepreneurship and creativity" U.S. President Barack Obama, March 2009

To say that society is developing and innovating like an express train is merely stating the obvious. The classical-methodical education model dates from the industrial age when there was a need for a lot of people who possessed the same standard skills so that they could all do the same work. In today's complex society, professions are changing faster and faster, the range of profiles/positions within a profession is increasing all the time, and we are also seeing the emergence of more new professions and positions. Virtually all repetitive processes are being replaced by ICT based applications. Employees are expected to continue working on their professional development and learn to cope proactively with change. They are expected to make knowledge their own and be able to apply this knowledge autonomously in new situations.

Dealing with complexity

New research insights, innovative nursing procedures and operations, and changes in the organisational structures in the sphere of work are some of the items covered in the course material. Lecturers, rightly, want to update their lessons as much as possible. However, this leads to a considerable increase in the course material. Enquiries in the VIVES Roeselare Campus copying service have shown that on average the courses are becoming 10% more extensive *each year*.

The constant expansion of the course material means that timetables are full to overflowing. More and more classes have to be given, and this puts even more pressure on both students and lecturers. However, it also means that students have to process more knowledge so that their essential basic knowledge becomes increasingly snowed under.

The endless growth in knowledge in the curricula is *not a good way* of dealing with the growing complexity.

Where is education going?

Instead of an arsenal of ready knowledge (which can be acquired simply via Google) we particularly want to develop applied knowledge and the students' meta-cognitive skills, thereby concentrating on a smaller, yet more effective body of knowledge: investigative learning, active learning, critical reflection, creative thinking, self-discipline, and problem-solving teaching are skills which are absolutely essential to today's students if they are going to achieve much in the present innovation economy. Terms such as '21st century skills', 'lifelong learning competencies', or 'core competencies' are largely comparable to each other in this respect and are largely interchangeable.

This is how we teach students to develop their own systems of knowledge so that, armed with a sound basic knowledge, they themselves learn to deal with the complex knowledge society in which we live. In this respect our approach is closely related to the constructivist learning theory.

Constructivism and blended learning

Over the last decade, educational neuroscience has provided a lot of empirical support for the constructivist educational model. It has emerged from brain research that the brain is capable of adapting to changing circumstances time and time again. This means that the brain (influenced by the environment) can learn new things again and again and therefore become more intelligent. Neuroscience has shown that brains do not so much 'store' knowledge as 'construct' it (Crone, 2012; Jolles, 2012).

Although traditional classical-methodical education does not meet the demand for proactive and versatile employees, this does not mean that this model is no longer valuable. A sound body of knowledge is still vitally important, but the traditional monolithic approach to

education needs to be broadened from a simple (classical) didactic approach to a combination of various didactic strategies i.e. a mix of (digital) methodologies (blended learning).

Blended learning

During the academic year 2013-14, after years of intensive preparation, we made a start on blended learning in the initial phase of the bachelor's nursing course at VIVES Roeselare. This meant a radical didactical change for the lecturers. Whereas tuition had previously consisted entirely of lectures, the number of lectures has been halved. The remaining number of contact hours has been restructured into 25% (inter-)active lectures and 25% guided private study through e-learning.

Lectures

As in the past, lectures serve to build up the students' body of knowledge. A sound body of knowledge and skills training still constitute the foundation for training students to become competent professionals.

According to Mink (2008), a lecture has three inextricably linked objectives:

- A conditional function: A lecture motivates students and stimulates their interest in the teaching content.
- An orientational function: A lecture informs students about the teaching content, outlines the main points, gives examples and clarification, increases student insight into the teaching content, and structures the teaching material.
- A practical function: A lecture provides an opportunity for the lecturer to ask questions, give assignments, and improve assignments.

Guided private study through e-learning

After a lecture in which the lecturer has applied the necessary attention to an item of teaching matter, the students prepare themselves independently for the (inter-)active lecture via private study.

Students are provided with all the learning material (documents, power points, and photographic and video material), integrated in one multimedia syllabus. They are free to prepare for a (inter-)active session individually or in groups. The university college provides the necessary rooms for group preparation, but remote study and teamwork via the social media (synchronously or asynchronously) is equally possible.

After the private study students can test themselves with an online self-assessment tool with to see if they are ready to go to the (inter-)active lecture. The self-assessment tool is a web-based application which is used to generate personal tests with automatic feedback. This will be demonstrated on the conference.

(Inter-)active lectures

In a lecture the lecturer is the instructor and the role of the student is usually limited to passive listening and taking notes (Bellis & Thomas, 2008). The focus is mainly on increasing the student's theoretical body of knowledge.

In a (inter-)active lecture the focus is on the student to learn and the lecturer is there mainly to supervise the process. The focus is on processing knowledge and how to apply it in practice. The working forms are chosen in accordance with the meta-cognitive skills at the heart of the (inter-)active lecture.

The students work on authentic practical situations in which they are stimulated to develop their own lines of reasoning, try things out, and experiment. It doesn't matter if they make mistakes, provided that they learn from their mistakes.

The working sphere in the school

To make these authentic practical situations even more real, the students work with HFPS models (High Fidelity Patient Simulators). In a purpose-built hospital room, students come into contact with lifelike situations to which they have to react. This teaches them to deal with problems, reflect on their own actions, work together with colleagues, and other disciplines. After having completed the scenario, the group of students dwell upon their own actions and those of others, thereby guided by a facilitator. The scenarios become more involved with each new training phase.

Evaluation

Sergiovanni and Starratt (2007) have stated that evaluation is often viewed as 'the tail that wags the dog'. What they meant was that 'what is assessed is what gets taught, which becomes or defines the curriculum'. Evaluation should never be something that takes place after the instruction with a view to obtaining a certain grade, but should be a relevant part of the teaching process.

In lectures the (main) focus is on the development of the body of knowledge and thereby the more basic cognitive skills (remembering, understanding, and applying). In (inter-)active lectures the (main) focus is on the development of the more advanced cognitive skills (analysing, evaluating, and creating). For this purpose we have used the taxonomy of Bloom, revised by Krathwohl and Anderson (2001).

Depending on the proportion of lectures and (inter-)active lectures, a testing matrix is drawn up for each subject in which the more basic cognitive skills versus the more advanced cognitive skills are reflected in the examination questions.

Inquiry among students on their digital preferences and needs for learning

In order to optimise and refine our blended learning concept, we launched an inquiry amongst our students (n=350) to ask them about their digital needs and preferences in their study. 91 students participated.

Properties of the students

83.1% of the students are female. Their average age is 24 years. 33.8% of the participating students are freshmen, 26.5% are sophomores and 39.7% are final year students.

Smartphone ownership and use

86.8% of the students have a smartphone. Six out of ten owners of a smartphone use it during studying. The purpose of the use lies in the quick search of meaning of notions and terminology, connecting with other students and connecting with the internet when they are no possibility to use other appliances (i.e. on the train).

Tablet ownership and use

53.0% of the students have a tablet. 58.0% of them uses their tablet during studying. They use it to look at the PowerPoint presentations of the lectures, to search for information, communicating with the fellow students and for their relaxation.

Laptop computer ownership and use

Almost every student (98.8%) has a laptop. 92.7% of the students uses a laptop for study purposes. Besides the purposes found in using the tablet and smartphone, (search for information, look at the PowerPoint presentations and communicating with fellow students), they also process information with their laptop. Making summaries and linking the digital course material with the paper course material are some of the activities.

The use of social media

62.3% of the students uses social media while studying. Facebook is by far the most popular medium.

They use it to ask questions, to share summaries and to get moral support.

Self-assessment

We asked the students if they want to make use of digital self-assessment tools in preparation of (inter)active lectures and exams. 86.7% of the students want to make use of digital self-assessment in preparation of an (inter)active lecture. In preparation for an exam even 96.4% wants to make use of a self-assessment tool.

Video recording of lectures

54.2% of the students demand video recordings of the theoretical lectures. Video recording of technical proceedings is demanded by 70% of the students.

Digital course material

We asked if students wanted more digital enhanced course material. Their answers were: 9.6% always, 33.7% regularly 42.2 sometimes en 14.4% no need.

Only 1.2% of the students prefer to use only digital course material while studying. 55.4% of the students prefer paper course material and 43.4% prefers a combination of digital and paper course material.

Conclusion

By mixing different learning methods, we challenge students. In the interactive courses and during simulation sessions, they are more confronted with practice. They develop more 21st century skills and they are better prepared for the practice.

Our students have the material tools to enhance our blended learning concept.

In order to meet the demands of the students we will continue to implement the digital self-assessment tools. We also will make more video recordings of technical proceedings.

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STORIES FOR LEARNING: AN UNCHARTERED TERRITORY IN THE FIELDS OF EDUCATION

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In the Comenius project Tales teacher trainers, language teachers and professional storytellers from Austria, Belgium, Estonia, Italy, Norway, Portugal and the UK research and develop storytelling as a new learning scenario. Through curricula research, surveys, collection of good practices and the organisation of training days and pilot projects we develop educational pathways linked to the key competences of the 21st century.

In this paper we discuss twenty reflections on good practices we have gathered so far. We describe the target audience, nationality, the European dimension, the link to the European key competences, the importance of a storyteller, choice of stories and the difference between oral and digital storytelling.

Then we adopt the four waves Joe Lambert has discerned in the evolution of the Center for Digital storytelling: creative, literacy, methodological and ethos wave. We use these steps as a lens to reflect critically about the use of digital stories in education.

To conclude we pose some questions linking the results of the reflections on good practices to Walter Ong's question about storing, organising and communicating knowledge in a digital age and to Bolter & Grusin's axiom that new media arise when old media fail to do something or are unable to comply with new creator's wishes. Finally we connect to Michel Serres who proposes narratives as a possible way of discovering truth.

Twenty good practices of storytelling in the classroom

Every teacher uses storytelling yet there are not many references in national curricula about how to use it. From our survey we also understand that both teachers and storytellers find it hard to explain the educational rationale behind storytelling in the classroom. We therefore devised an in-depth questionnaire asking teachers to reflect upon their storytelling praxis.

The target audiences range from primary school (ten examples) to secondary (seven cases) and teacher training education (seven good practices).

So far we have been able to collect two Austrian, five Belgian, one Estonian, three Italian, two Norwegian, two Polish, two Portuguese, one Swedish and two British good practices. Although we might have chosen to differentiate between national and European projects: fifty percent of all good practices are developed in European contexts:

- Storytelling Festival in Primary School – UCLL – Belgium (international course);
- What does the teacher say? – UCLL – Belgium (international week Come2Graz));
- Of Cuberdons, Belgian Waffles, Beer and meatballs from Liege – UCLL – Belgium (Grundtvig project L2LByTe);
- Is there a Moocy Way? – UCLL – Belgium (ECER conference);
- Legend of the White Lady – Estonia (Comenius School Partnership project: From Fantasy to Reality: A Voyage of Discovery);
- Under the same sky: my food is your food – POLIMI – Italy (international storytelling competition);
- Bella, buona e solidale (Beautiful, good and responsible) – POLIMI – Italy (international storytelling competition);
- Bones don't lie – POLIMI – Italy (international storytelling competition);
- Polish-French Dragon Hunt – Poland (bilateral project);
- European Tales Day – Poland (Multilateral School Partnership Comenius).

Storytelling and key competences

We asked the contributors of good practices to link their storytelling teaching to the European key competences and we got the following results: cultural awareness and expression (9), digital competence (9), communication in mother tongues (8), communication in foreign languages (7), learning to learn (6), social and civic competences (5), sense of initiative and entrepreneurship (2) and mathematical competence and basic competences in science and technology (1).

We have to say that not every contributor linked their goals to the key competences in particular. They described their goals in their own field of expertise or merely enumerated some key competences. They certainly did not explain it as thoroughly as this Austrian French teacher did reflecting on the learning trajectory of Spielstadt:

- Communication skills in foreign language (mother tongue in primary school): being able to express imagination and ideas, to present one's project to an audience;
- Mathematical competence, basic competences in science and technology. occasionally (see detailed description);
- Digital competence by using ICT and producing documents (texts, pictures, videos);
- Learning to learn by different ways of working (on one's own, with a partner, with a group);
- Social skills by the ability to listen and accept other ideas, by creating and planning together concepts, by finding generally accepted solutions, ...;

- Civic competences by the acquirement of social and political basic knowledge, often in comparison to the situation in one's own country (see detailed description);
- Sense of initiative and entrepreneurship by simulating and calculating the opening or closing a business, a restaurant, by planning a fictive cultural or athletic (...) event, a fair, etc.;
- Cultural awareness by learning and comparing customs, diverse fields of culture, media and so on. (Elisabeth Glavič, <http://www.storiesforlearning.eu>).

Furthermore quite a few teachers stressed the energy, the enthusiasm, the imagination and creativity of their students taking all kinds of action to create a story. Unfortunately these features were not linked to a sense of initiative and entrepreneurship. It is our hypothesis that entrepreneurship is still being defined in its narrow sense linking it predominantly to starting and running a business of your own.

Some contributors (Norway and Portugal) added the competence of being able to tell a story. For instance the Portuguese contributor of "Story House" points at the relevance of "narrative skills (sequencing, suspense, point of view, etc.)".

Similarly the Norwegian contributor of "Storytelling theatre" refers to the teacher plan which stipulates

"that students should be able to:

- use basic techniques of storytelling*
- explain some basics about storytelling*
- compile a storytelling program for a specific audience*
- facilitate a storytelling situation*
- explain storytelling as a pedagogical method."*

Their colleagues, Marianne Sundal and Lise Grimnes, also question whether it is possible for all teachers and students to become storytellers. They therefore resorted in their "Storytelling School in Skedsmo" to a form of microteaching,

a type of "flashlight education" related to the story. It means that (...) the teachers should look through the subject material, and learn to "spot" storytelling material in texts they have to convey. It can be character description (Napoleon), or just a picture or a scene (when Semmelweis understands he must wash hands). Then we work on this exact detail to make it come alive so that it can be merged into teacher education as it already is.

By working in this way, all teachers can use the ideas and methods related to the art of storytelling, without it being too time consuming.

Oral or digital storytelling?

We distinguished between oral and digital storytelling using Lambert's definition of digital storytelling as interweaving "different media to support the art of storytelling" (Lambert, 2006). Contrary to our expectations we gathered more good practices of digital storytelling.

Of the twenty stories eight used oral storytelling in class using no technical support:

- Of Storydragons, Silvernoses and Bookworms – PHSt – Austria;
- Storytelling Festival in Primary School – KHLim – Belgium;
- Storytelling theatre, Halden upper secondary school – Norway;
- Storytelling School in Skedsmo, with Marianne Sundal and Lise Grimnes – Norway;
- Story House (Casa das Histórias) – Chapitô in a partnership with the Ministry of Justice Institute for Social Reinsertion – Portugal;
- The Collection Bag – Portugal;
- Dragons and monsters –Sweden;
- Primary Languages Storybox Project with Goldsmiths PGCE Primary Course The Language Company – United Kingdom.

Twelve opted for digital storytelling using PowerPoint, moviemaker, photos, audacity, apps and digital platforms to create and share:

- Spielstadt – Jeville – Playcity – Austria;
- Making digital stories with MS PowerPoint or MS Movie Maker – UCLL – Belgium;
- What does the teacher say? – UCLL – Belgium;
- Of Cuberdons, Belgian Waffles, Beer and meatballs from Liege – UCLL – Belgium;
- Is there a Moocy Way? – UCLL – Belgium;
- Legend of the White Lady – Estonia;
- Under the same sky: my food is your food – POLIMI – Italy;
- Bella, buona e solidale (Beautiful, good and responsible) – POLIMI – Italy;
- Bones don't lie – POLIMI – Italy;
- Polish-French Dragon Hunt – Poland;
- European Tales Day – Poland;
- Multi Lingual Digital Story telling – Peace School London – United Kingdom.

This choice also seems to influence the didactical approach as a whole where oral storytelling classes prefer to work with professional storytellers starting from existing stories such as folktales, legends, myths and children's books whereas digital storytelling environments invite students to create their own stories. The teacher is a facilitator or co-storyteller. In oral storytelling the children perform whereas in digital good practices stories are shared.

There is also a strong correlation between digital storytelling and European-based education as nine out of the ten European embedded projects have chosen for digital storytelling.

Four Phases in Digital Storytelling

In his blog storytelling.org Lambert distinguishes four phases in the expertise of the centre for digital storytelling: the creative, the literacy, the methodological and the ethos wave. During the creative episode they tinkered with new media to create family movies, reach out to new audiences, awaken new emotions, create new meanings. There is no method involved here. Fun and creativity were the main purposes. Next they started to introduce digital storytelling in the curriculum engaging students into seeing their own stories in different ways through multimodal thinking and producing: the literacy wave. Students are taught how to create digital stories. After some years the focus of digital storytelling shifted to the facilitation model creating collaborative storytelling platforms, using social media and communities with its facilitators: the methodological wave. Finally they started exploring digital storytelling as a means to give voice to the silent, create mindful awareness, allow human beings to share “certain aspects of woundedness” and thus become a survivor: the ethos wave.

Looking at the digital storytelling good practices we can however find but two waves. Some focus on having fun and this creative wave could be linked to the maker culture, do-it-yourself students, bring-your-own device and learning-by-doing:

- Spielstadt – Jeville – Playcity – Austria;
- Making digital stories with MS PowerPoint or MS Movie Maker – UCLL – Belgium;
- Of Cuberdons, Belgian Waffles, Beer and meatballs from Liege – UCLL – Belgium;
- Legend of the White Lady – Estonia;
- Bella, buona e solidale (Beautiful, good and responsible) – POLIMI – Italy;
- Polish-French Dragon Hunt – Poland;
- European Tales Day – Poland.

Others try and unearth silent stories. Through communities and platforms they try to make heard teacher narratives, compare Ethiopian with Italian traditions, motivate bored students to find their own narrative, connect Arab students to modern Arabic stories:

- What does the teacher say? – UCLL – Belgium;
- Is there a Moocy Way? – UCLL – Belgium;
- Under the same sky: my food is your food – POLIMI – Italy;
- Bones don’t lie – POLIMI – Italy;
- Multi Lingual Digital Story telling – Peace School London - United Kingdom.

So far nobody has indicated there is a need for students to learn how to create digital stories similar to the Norwegian and Portuguese oral storytellers. Secondly, although the facilitation model is used by the teacher-facilitators themselves nobody seems to find it necessary for their students to know more about creating story platforms. Given the high correlation between digital storytelling and connecting in European contexts this is even more puzzling.

Questions

Walter Ong has defined oral storytelling as our primary way of helping us to store, organise and communicate our knowledge. Jerome Bruner (1987) has defended both the logical-analytical as well as the narrative way as knowledge construction. And Michel Serres has proposed narrative as a path to find the truth in educational research:

Devoted to the search for truth, we do not always reach it; if and when we arrive through analyses or equations, experiments or formal proofs, but also through experimentation, sometimes, and, when experimentation doesn't get you there, let the story go there, if it can; if meditation fails, why not try narrative? (Serres, 1997, pp.165-166)

Adopting Pink's Five Whys technique we can wonder why storytelling does not account for 50 percent of the educational experience (Pink, 2013, p.151)? Why do we underestimate this way of storing, organising and communicating knowledge, of knowledge construction and truth-seeking? Why do we not teach about it? Why do we hide our storytelling teaching praxis? Why don't we link storytelling to the key competences of the 21st century? Why don't we link storytelling to digital media?

Bolter and Grusin (2000) claim that new media arise to fill a lack, repair a fault, and fulfil unkept promises. Old media as a rule fail to include the audience. Conversely older media "refashion themselves to answer the challenges of new media" (Bolter & Grusin, 2000, p.15). We put it to you that digital stories allow students to share their learning experiences which offer vital data for learner-driven approaches. Digital storytelling also facilitates linking to knowledge and other students which is the core in connectivist learning. Moreover digital storytelling makes sure the diversity of learners' and teachers' voices will be heard in the educational debate dominated by cutbacks but also by innovative digital approaches inviting students to learn anywhere and anytime, in Facebook groups and MOOCs for instance. Next it is our hypothesis that oral storytelling will specialise in engagement through fine-tuning and researching storytelling and narrative literacy. And in a time of increasing numbers of drop-outs we will not only need both fields of expertise but we also need to build a bridge between them.

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COMPETENCE FRAMEWORKS IN AGRICULTURE – PACT

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Background

Agriculture is suffering from a lack in qualified employees as well as appropriate, tailored-made and modularised VET opportunities. The demand for qualified farm workers and managers is not satisfied by an adequate supply of properly trained staff or training opportunities, especially in the light of environmental (climate change and biodiversity loss), economic and territorial challenges, as well as EU directive reforms (Common Agricultural Policy (CAP)).

In particular Competence Modelling is raising the awareness and interest of all stakeholders in lifelong learning in the agricultural sector: It is gaining importance for organisations and their human resource development, for employees and individual learners, for education and training providers as well as for political decision maker. In previous projects like WACOM [1], eCOTOOL [2] and AGRICOM [3], many users have asked how to implement the competence model provided by the projects. Even though these projects also include clear instructions on how to use the competence model in the pilot testing, the users expressed their need and their ideas for an enhanced communication between employers and training providers with the help of the competence model. In essence these three projects showed that a concept like the planned “Pathways for Agricultural Competence and skills based Trainings” (PACT) are in demand and needed both by the employers, the employees as well as by the training providers. Many employers which have contributed to WACOM, eCOTOOL and AGRICOM stated that a PACT Framework would definitely have a great value for them: The facilitated description of job profiles and the mapped training opportunities would help to decide on personal development faster and more economically. Furthermore many training providers stated that such a structure would allow them to describe their training offers more precisely and that they would be able to adapt their training programmes more to the needs of the users. After considering this feedback preliminary surveys have been implemented. The interviews with experts from main agricultural fields indicated again the need and demand for such a development in the whole agricultural sector.

Agricultural VET providers, labour market and VET policy makers often use different terminologies and concepts in order to approach training, and a common sector-specific approach with shared definitions among the different actors involved is necessary to create a

stronger link between emerging job profiles and training opportunities. Launching ECVET and EQAVET has been a major achievement in Europe, which can ease these processes, but adoption in agricultural E&T is moving slowly.

However, we observe the following:

- Many VET providers offer trainings for the agricultural sectors, which do already address the needs of a changing agricultural labour market or current EU/national policies, training opportunities of the ACT consortium members;
- Some VET providers have modularised their trainings, introduced the learning outcomes approach which in fact facilitates the update with units from “peer institutions” which address labour market needs to a certain extend.

Furthermore, there is no central multilingual database of trainings for the agricultural sector in Europe, less so a portal which directly addresses current skills gaps.

Agriculture – The situation in Europe [4]

The contribution of agriculture and forestry to macroeconomic gross value added in the EU 28 was 1.7 per cent in 2012. This accounts for a share of 1.7% of the gross value added and a share of 4.9% of people employed. There are major differences between the individual Member States. For example, the share of employees ranges between 2% in Germany and 23% in Romania.

There are great differences between the agricultural farm structures and training of the workers within the EU. More than half of the farms in the EU are very small and only farm a very small area. Only a few very large farms farm about half of the agricultural area. Family labour predominates throughout the EU. In view of the different training paths within the EU there are also major differences in the qualifications of the farm managers. E.g. the training and education in Agriculture in Greece is limited and the majority of the farm managers learned their profession through practical experience (96.5%), while only 0.3% had completed a full cycle of agricultural training. In EU the respective values for the above parameters are 71% and 6.9%.

Competence frameworks in agriculture

ECOFARMER

The functional characteristics of the EcoFarmer can include to be competent in applying a wide range of diverse working and managerial activities which has to do with the farm prosperity, the environmental protection and the human health, to be responsible of taking decisions, susceptible to self-control and expecting the same from the others who are bound to him in similar tasks. He recognizes the agricultural activities as being valuable for the society and implements any pioneering agricultural practices. The farmer is familiar with the international and national organic agriculture organizations and analyses and assures a transparency in all of the activities of the organic production. He adopts willingly any innovative methods and technologies and applies preventive measurements to protect the

environment by combining the economic interests with the natural ones. The farmer attends as well courses for improving their professional qualification EcoJob-AP and proves this by applying new knowledge and skills.

EcoFarmer professional competences can be grouped in:

- Managerial competences;
- Production competences;
- Information Technology competences;
- Key competences.

ECOEXPERT

EcoExpert-AP regards competence, which includes an application of a significant scope of fundamental principles in a wide and often unpredictable diversity of contexts, a significant range of a logical freedom, and often with a considerable responsibility for the work of the others, as well as a personal responsibility related to the analysis, design, planning, application and evaluation.

The EcoExpert professional competences can be classified in the following areas:

- Managerial competences;
- Communicative competences;
- Technological competences;
- Psychological competences;
- Competences to apply innovations;
- Key competences.

AGRICOM

The AGRICOM (Agricultural Competence Model) framework defines the principal competences for the employees working in the agricultural sector, particularly in irrigation and hydroponic and can be transferred to other fields. As a result, AGRICOM leads to an increase of the mobility throughout Europe as well as to a higher transparency and recognition of qualifications and competences. The Agricultural competences which compose the competence model were elaborated through an online survey and national workshops organised in the user partner countries (Germany, Italy, Greece, and the Netherlands).

The AGRICOM Project was based on the competence model developed for the water resources management in the Water Competences Model Transfer Project (WACOM) as the fundamental input, EU policies like the European Credit System for VET (ECVET) and the European Qualification Framework (EQF) and the German specification PAS 1093 on Competence Modelling and takes advantage and transfers them into the agricultural Sector and its VET systems throughout whole Europe. The requirements of the different European stakeholders were discussed and identified, consisting of several European workshops, an online survey and a desk research.

A detailed description of all collected competences allows a standardised usage of the AGRICOM Competence framework. The Agricultural Competences are the complete list of competences for the agricultural sector directly related its requirements and needs, the working places and job profiles.

These Agricultural Competences include:

1. Key competences for the agricultural sector: For the specific objectives and purposes of AGRICOM and the framework the key competences from the European policy have been adapted as far as they are in line with the needs and requirements of the agricultural sector;
2. Agricultural competences: The competences were categorised for a better usability and overview in two categories:
 - managerial or individual competences;
 - professional or agricultural competences.

The PACT framework

On the basis of desk research and focus groups/interviews in several European countries, the PACT framework was derived. It contributes to making definitions of competences reusable and accessible across learning and recruitment systems, thus facilitating the development of additional services related to the generation of personal profiles, achieved learning outcomes and competences. The PACT Framework - matching emerging job profiles and existing training opportunities - links training opportunities and units of training to learning outcomes, the expression of job profiles through the use of competence descriptions and the generation of personal profiles of achieved learning outcomes and competences.

Competences and skills in PACT

1. Systemic, holistic thinking and sustainability
 - Derive and implement conclusions;
 - Take views of others;
 - Estimate possible impact of different actions;
2. Self-management
 - Self-organisation;
 - Self-assessment/-reflection;
 - Self-initiated development;
 - Self-directed learning.
3. The capacity for interaction
 - Internal communication towards peers / employees / employers;
 - External communication towards customers / providers;
 - Cooperation / teamwork / networking;
 - Conflict resolution.

4. Organic farming
 - Organic cultivation;
 - Change management from traditional to organic farming;
 - Use of resources.
5. Technical and scientific innovation
 - New production technologies;
 - New processing technologies.
6. Further agriculturally related sources of income (incl. renewable energies)
 - Renewable energies;
 - Tourism;
 - Processing of primary products;
 - Extended commercial activity (e.g. new groups of clients).
7. Business administration/management
 - Process and risk management;
 - Marketing and distribution;
 - Concentration, diversification and individualisation;
 - (Electronic) Resource planning;
 - Legal issues (e.g. contracts).

Further plans

In a next step, a specification to translate the PACT Framework into terms of database and portal development will be elaborated, specifying the way the various objects such as training opportunities, competence definitions, job profiles, diplomas and certificates will be connected and combined in a searchable portal [5].

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A VALUE CREATION FRAMEWORK FOR AN ONLINE PROFESSIONAL LEARNING COMMUNITY

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Introduction

As economic constraints leave fewer resources available for professional development, researchers and practitioners have become increasingly interested in the interplay between learning, community and technology. They are examining the potential of online communities of practice to enhance and extend traditional professional development opportunities (Booth & Kellogg, 2014). They support the idea that participation in a learning community leads to change practice behaviours (Vescio, Roos & Adams, 2008). According to Booth and Kellogg (2014), in online communities of practice, practitioners “co-construct newforms of meaning and understanding in ways that are individually and collectively valuable, and apply that knowledge in their professional practice” (p.1).

In addition, for supporting professional development opportunities and continuing education, e-learning technology revolutionise learning and life-long learning for example, in supporting resources and guidelines for participation that are appealing and valuable for busy practitioners (Booth & Kellogg, 2014). The potential of e-learning technology is to extend professional development opportunities in terms of information and community resources available with the benefits of connectivity, flexibility and interactivity (Knight, 2004). E-learning technology should be seen as an interactive tool to support the active involvement of the learner with peers in sharing and creating new knowledge (Kurtz, 2014). In the health sector, e-learning technology gives the opportunity to network with other likeminded professionals for prevention, training and innovation (EC, 2012).

Our project is to combine learning, community and e-learning technology in the health sector. This project is part of an European FP7 training network, iCARE (improving Children’s Auditory Rehabilitation), which aims at training a community of people with different approaches and expertise in different fields and specializations. This community of people includes researchers, audiologists, educators, teachers, speech therapists, caregivers, parents and deaf children who are part of the same professional network. For the inclusion of children with hearing impairment in the oral society, they pursue – with different levels of expertise and experience – a common goal: the development of communication and social skills in these children.

In that context, we aim to develop an online professional learning community (PLC) which will permit all members of that community – individually and collectively – to extend their professional and personal development opportunities through different types of e-learning activities, tools and interactions. This PLC, as a community of practice will be characterized by the creation and sharing of user-generated materials, improving the auditory rehabilitation of children with hearing impairment. This PLC involving parents and other caregivers into the children's learning experience will enable sustained mutual engagement of all professionals, allowing them to explore good practice, articulate perspectives, accumulate knowledge and create a shared context for ongoing exchanges (Vescio, Ross & Adams, 2005; Wenger, White & Smith, 2009).

As mentioned by Wenger, McDermott and Snyder (2002) the purpose of designing a community is not to impose a structure but to help the community develop. Because communities of practice are organic, they are built on existing networks; designing them is more a matter of shepherding their evolution than creating them from scratch. Wenger et al. (2002) propose seven principles for cultivating a PLC:

1. design for evolution,
2. open a dialogue between inside and outside perspectives,
3. invite different levels of participation,
4. develop both public and private community spaces,
5. focus on value,
6. combine familiarity and excitement and,
7. create a rhythm for the community.

We use these principles in our project as guidelines. Obviously, these design principles are not recipes, but help us to understand how elements of design work together.

Conceptual framework

For our purpose to develop an online PLC, we are using the value creation in communities and networks' framework designed by Wenger, Trayner and de Laat (2011). This framework is a combination of the community of practice and social network concepts.

From a developmental perspective, the coexistence of these two aspects suggests two types of cultivation work for those who endeavour to foster learning. The work of community is to develop the learning partnership that creates an identity around a common agenda or area of learning. It is to specify why people are there, what they can learn from each other, and what they can achieve by learning together. [...] The work of network is to optimize the connectivity among people. It is to increase the extent and density of the network by strengthening existing connections, enabling new connections and getting a speedy response. (Wenger et al., 2011, p.14)

Furthermore, Wenger et al. (2011) mean by “value creation”, the value of the learning enabled by community involvement and networking. In other words, what learning opportunities do they each offer and what value do they produce in short and long-term aspects? For instance, “there can be short-term value in solving problems that members have in their practice, but over time the approaches and solutions to these challenges become cumulative resource for members facing new challenges” (Wenger et al., 2011, p.17).

More specifically, Wenger et al. (2011) determined five cycles of value creation in networks and communities:

1. immediate value,
2. potential value,
3. applied value,
4. realized value and,
5. reframing value.

These five cycles taken together provide a dynamic framework of aspects of value creation to pay attention to. Each aspect of value creation is likely to be important to different stakeholders. For example, “facilitators may be more interested in successful activities or the production of outputs (cycles 1 and 2). Members might care about solutions to challenges in their practice (cycle 3) and definition of success (cycle 5). Managers might be more interested in performance (cycle 4)” (Wenger et al., 2011, p.25). The advantage of this value creation framework is to support heterogeneous communities.

To develop an online PLC with members with totally different backgrounds is not common. The skills and knowledge of members may be very broad in some online communities, which is often not the case in cooperative work groups, which are more homogenous or deliberately selected to be complementary (De Souza & Preece, 2004). Furthermore, many online communities exist on the internet and are open to a wide variety of people whereas many cooperative work communities are on the Internet and membership is restricted (Ibid.). Within the value creation framework, our project is to develop an interdisciplinary online PLC with groups of people all concerned about improving children’s auditory rehabilitation.

For this reason, we plan to start a pilot project with volunteers. We will provide them with different types of e-learning activities, tools and interactions in a dedicated space. They will benefit both from scientific and professional resources and connections between the members. Our hypothesis is that we are all trying to learn by ourselves, utilizing the opportunities we can have from workplace, Internet, etc. Thus, we will offer a new space for them to improve their professional development with relevant resources. We are still designing the process and methods to achieve our aim.

We expect as results at the end of the pilot project to generate enough value creation into this online PLC to attract and engage members. In other words, we expect that the members of the PLC will generate new knowledge and support each other to reinvest that knowledge in their ongoing professional and personal practice.

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TRANSFORMING, EXPANDING AND ENRICHING LEARNING SCENARIOS WITH COOPERATIVE LEARNING IN SELF-PACED COURSES

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The project (Evaluation in progress): Exploratory Evaluation Survey

This poster summarizes the work-in-progress for the evaluation of the entirely redesigned online self-paced course Human Geography 302: The Canadian North. With the goal of enhancing students' performance, expanding the learning scenarios in the course, and enriching students' learning scope the course was fully redesigned using cooperative learning strategies. Also, learning design with a critical-thinking approach was adopted with the view of immersing students in a supportive and reflective learning environment that fosters engagement, critical thinking and deeper learning. Pedagogically sound teaching-learning strategies were embedded in the curriculum such as breaking down and sequencing open-ended assignments with the purpose of engaging students in their own learning; open discussion of course work that allow students learning from one another; interactive dynamic maps for students to share their learning experience; and formative evaluation for tutors to track students' progress closely and provide them with rich feedback on timely fashion. An exploratory evaluation survey was designed to learn about students' perceptions concerning the cooperative learning strategies recently adopted in the course. In particular, we want to know how much students think these strategies facilitate, expand, and enrich their learning. Despite still it is early, preliminary findings are showing positive results. After the course was redesigned, grades of students who completed the course are showing some improvement in students' performance and engagement. Conversations with students confirm that they appreciate the cooperative learning approach and find beneficial the interaction with other students through the new technologies adopted in the course. The first preliminary data is showing that students enjoy the new learning environment. The expectation is that the online dynamic map network embedded in the course may contribute to students' deeper understanding of the subject matter. All in all, still the evaluation is not mature enough to make solid conclusions. The survey is intended to remain open until the end of 2015.

The Context

Human Geography 302 is a senior-level undergrad, three-credits course in human geography. It is suitable for students interested in the geography, culture, and sustainable development of Canada's North. The course has been designed to link and build from knowledge that students may have acquired in other courses. It presents an overview of the human geography of the Canadian North, covering diverse topics such as: Imaginings of the North; The biophysical features of Canada's North; The history of European exploration and contact with indigenous northern populations; Aboriginal culture and society; Political developments in the North and Natural resource developments.

Athabasca University Undergrad Model

- Open Education: older than 16, but no other requirements;
- Online Distance Education;
- No face-to-face experiences;
- Continuous Monthly Enrolment;
- No cohort groups;
- Self-paced;
- Individualized Studies;
- No deadlines for assignments;
- 6 Months Contract (paid extensions);
- 1 Tutor Per Group: groups up to 30 students;
- Study Guides, course materials, readings, etc.;
- Tutors assist/guide students and mark assignments (they don't teach online).

The Problem – Concerns before redesigning the course

- Students were complaining about isolation;
- Students-students interaction did not exist in any way;
- Students' engagement was low and drop-outs and failure was somehow high;
- Students were not making sense of the vast cultural, historical, geographical, and economic richness of the Canadian North, which is the main focus of the course;
- Limited learning scope: regardless of the rich and diverse content of the course, students limited their learning scope to their own particular experience;
- Despite students had no contact, they were limiting the topics for their assignments and papers to the same traditional topics;
- The course was print-based only, with no online presence, and content was dated.

Theoretical Framework: Cooperative Learning

A central aspect of Cooperative Learning is transparency where students and teachers are made aware of and have access to each other's interests, thoughts, concerns, ideas, writings, references, and assignments.

- **Transparency** is an important driver for improved quality.

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- **Preventive quality improvement:** We are prone to provide better quality when we know that others have access to the information and contributions we provide.
- **Constructive quality improvement:** We may learn from others when we have access to their data and contributions.
- **Reactive quality improvement:** We may receive feedback from others when they have access to our data and contributions.

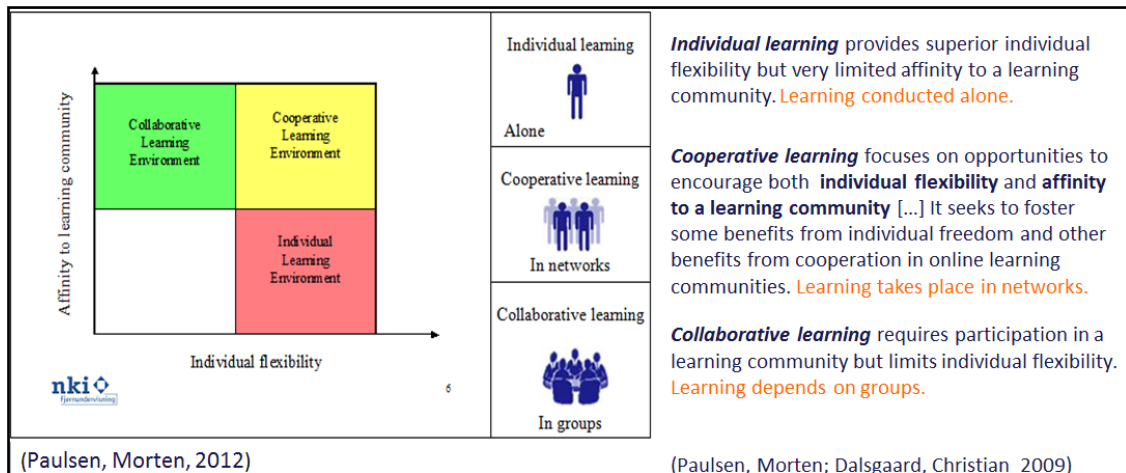


Figure 1.

Cooperative Learning Theories were used to fully redesign GEOG 302: The Canadian North

“Cooperative online learning facilitates individual freedom within a learning community in which online students serve as mutual resources without being dependent on each other.” (Paulsen, 2012)

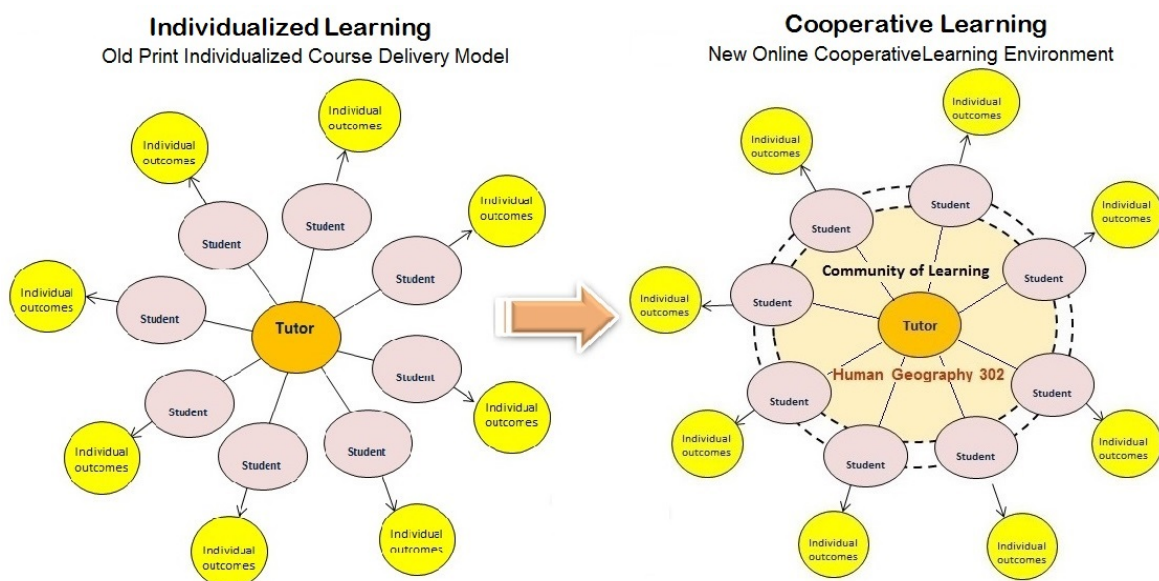


Figure 2.

“In cooperative learning [...], students share learning and the group energy (synergy) produces a knowledge and experience greater than the sum of each individual. Students encounter new ideas, perspectives, and experiences with their peers.” (Futch, 1999)

Methodology

Purpose and Significance of the Study

This study is intended to determine the views of students on cooperative learning. The study intends to inform and persuade professors and subject matter experts in Athabasca University (and beyond our community) about the positive implications and benefits that cooperative learning has for students in self-paced courses. The outcome of the study could form the basis for further research that could potentially determine whether or not cooperative learning strategies should be promoted for designing undergrad self-paced courses.

Delimitations of the Study

This study is focused on the undergrad, online, self-paced, individualized three-credits course GEOG 302: The Canadian North. The survey is expected to be in place until the end of 2015. Based on the results, the study would be extended to other courses where cooperative learning strategies have been adopted too.

The survey

The organization, sections, and sequence of the survey make close reference to the new structure of the course, learning strategies adopted and the online cooperative learning environment. The survey is available online and it takes 5-10 minutes for students to respond the questions. To increase the reliability of the survey, the researcher gained the assistance of individuals who have expertise in the knowledge of research. The survey was reviewed by other AU learning designers, the course coordinator, by tutors in the course, and other AU researchers with a wide experience in educational research.

Participants

Currently, there are 54 students enrolled in the course. The invitation and link to access the survey are embedded on the course's front page but hidden from students. These become visible and accessible automatically after students submit the last assignment and before getting their final mark. The invitation makes explicit that completing the survey is on voluntary bases and completely anonymous.

Evaluation Core Questions

- What are students' attitudes towards cooperative learning in individualized online self-paced courses?
- To what degree cooperative learning fosters students' deeper understanding of the subject matter?

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- To what extent cooperative learning enriches students learning experience?
- To what degree cooperative learning fosters students' engagement?
- To what extent do students perceive that cooperative learning strategies fosters positive attitudes towards learning?
- To what extent do students think cooperative learning enriches their learning scope in the course?
- To what extent sequenced assignments give students a better sense of developing disciplinary skills increasingly?
- To what extent formative assessment gives students better opportunities to meet the learning goals successfully?

Preliminary findings (Evaluation is in progress)

Note

The evaluation is not mature enough to make solid conclusions at this time. The survey is still in place and data continue being collected. By the time this poster is presented in the conference the data bellow will be updated and further results will be summarized in tables and charts.

Higher grades and greater engagement

Despite it is still early to reach conclusions, it is possible to observe a slight improvement on students' performance after GEOG 302 was fully redesigned (January 2014). The percentage of students getting better grades seems to be increasing whereas students getting lower grades seem to be diminishing. Failure and dropouts (Final grade=0) seem to be decreasing too. Better grades and less dropouts seem to indicate greater students' engagement.

Final Grades	March 20 2007 to January 14 2014		January 14 2014 Upto Today	
	N	%	N	%
0	123	26%	4	18%
55	2	0%	0	0%
58	2	0%	0	0%
62	7	2%	0	0%
65	6	1%	0	0%
68	16	3%	1	5%
72	12	3%	0	0%
75	29	6%	1	5%
78	56	12%	3	14%
82	103	22%	6	27%
87	75	16%	4	18%
95	34	7%	3	14%
Grand Total	465	100%	22	100%

Figure 3.

GEOG 302's final grades before and after redesigning the course. Source: Office of Institutional Studies, Athabasca University, March 10th, 2015

Cooperative Learning and New Technologies embraced by Students

Despite the close teaching-learning culture in Athabasca University for many years was about individualize studies, where the tutor-student interaction was the rule, and course materials were only in print, preliminary tutors' reports seem to indicate students appreciate the cooperative learning, the interaction with other students, and the use of new technologies that expand and enrich their learning scope. Open submission for assignments is not mandatory but students haven't complained or requested private submission of their work.

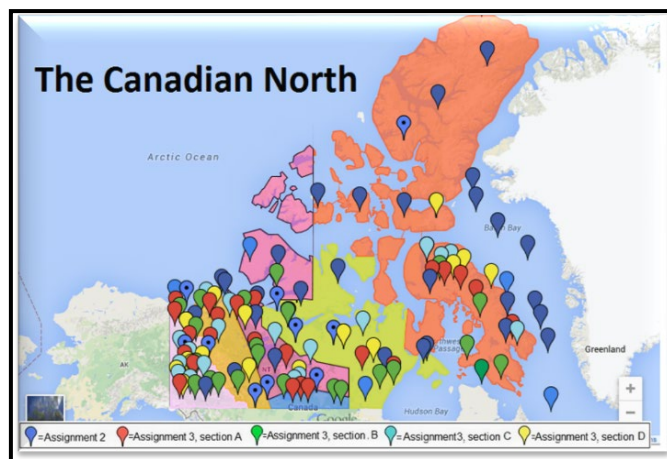


Figure 4.

"Hi Josh,

I really liked the Google Earth component. It did wonders for the course home page which would have been sort of bland without it. Also accessing other students assignments was informative and also gave me an idea of the course expectations, and using the map looked way better than if I had to access these assignments from some list. And obviously Google Earth is really cool and fun to use.

Regards,

K M"

(Source: Email from a student enrolled in the course)

GEOG 302 Google Dynamic Map

The above is a reproduction of the Google Map (March 2015) where students submit/embed course assignments. This map is embedded on the course's front page and the access is open to all students enrolled in the course. The public can access the map too (but the course).

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DISTANCE LEARNING FOR ADULT LEARNERS – NEEDS AND CONSIDERATIONS

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This paper discusses the contents of distance education for adult learners by reviewing the literature and discussing the point of views of some distance education authors and scholars.

Distance education, or distance learning, is a field of education that focuses on the pedagogy and andragogy, technology, and instructional systems design that aim to deliver education to students who are not physically “on site”. According to the U.S. Department of Agriculture, “is a process to create and provide access to learning when the source of information and the learners are separated by time and distance, or both”. In other words, distance learning is the process of creating an educational experience of equal qualitative value for the learner to best suit their needs outside the classroom. Rather than attending courses in person, teachers and students may communicate at times of their own choosing by exchanging printed or electronic media, or through technology that allows them to communicate in real time and through other online ways. Distance education courses that require a physical on-site presence for any reason including the taking of examinations is considered to be a hybrid or blended course of study. This emerging technology is becoming widely used in universities and institutions around the globe. With the recent trend of technological advance, distance learning is becoming more recognized for its potential in providing individualized attention and communication with students internationally.

The number of non-traditional students has grown more rapidly than the number of traditional students (U.S. Department of Education, 2001). The growth of nontraditional adult enrollment in higher education demands a different and more flexible delivery system to meet students’ needs (Chun & Hinton, 2001). Distance learning is designed to ensure compatibility with the characteristics and needs of the adult learner. By retaining their jobs while attending school, adult learners are able to continue to gain in work experience while pursuing educational goals (Nafukho, Thompson & Brooks, 2004; Lawrence, 2007). Kuhlmann provided some considerations when building e learning courses for adults they are as follows:

- **Set clear expectations and objectives.** Let them know why they’re taking the course and what they should be learning. People like to get oriented and know what’s expected of them.

- **Adult learners don't like to fail**, and they don't like to fail publicly. Make it clear when they are being tested and when they aren't.
- **Create an environment where they have as much freedom as possible.** Let them click around and explore. I know that many customers want to lock navigation so that they “get all of the information”. This is faulty thinking. If they need to confirm their grasp of the information, then give them exercises to practice applying it so they can demonstrate their understanding in a real way.
- **Give them ways to collect information.** This is a great way to counter the locked navigation issue. Create situations where they need to make decisions and then free up the navigation to collect the information needed to make decisions. This is a much better way to assess understanding than viewing a screen full of text.
- **Focus on relevance.** I've worked on plenty of projects where the learners are never considered. I recall one company I worked for that wouldn't let me talk to any potential learners, even though we were rolling the training out to 3500 people across the country. If your content isn't relevant to the learners, they'll just tune out and you're wasting time and money. You can guarantee that little learning will happen.
- **Create a visual design that is friendly and inviting.** This helps with the initial engagement and sets the tone of the course. I've had customers tell me that they can't do that because the subject matter was real important and serious. So they needed to have a very serious tone (read boring). If it's important, then it makes sense to create a course that's as visually inviting as possible.
- **E-learning is a multimedia experience** so it makes sense to leverage as much of the multimedia as you can (in context though). You don't want to add multimedia for the sake of it, but you do want to use all of your resources to create the best course possible.
- **Free Willy!** People are like orcas with floppy dorsal fins. They yearn to be free. One of the worst experiences in e learning is when the course navigation is locked. There are better ways to help people learn. Focus on relevant, decision-making scenarios. And if you're building a compliance, click-and-read course with no performance expectations, then make the course as simple as possible so that the learners can get in and out. Don't frustrate them or waste their time with a bunch of extra branched scenarios. Tell them what they need to know and let them go.
- **Do you need to test everything?** Every day we take in all sorts of information that is critical to meeting our goals. When my boss sends an email detailing new plans, he doesn't follow it up with a quiz. Assessing a person's understanding is an important part of learning, but do we need to always have a test? In many ways it retards the learning process. As soon as people find out they're being tested, they quit learning and focus on how to pass the test. If you don't need a test, don't include one. If you do need to assess their understanding, perhaps there's a better way to do so (Kuhlmann, 2011).

To make it even more convenient, distance-learning courses can take place in hybrid form, which combines various technologies for communicating via networks and which allow the instructor to evaluate students who undertake such programs or curriculum. According to Twiss and O'Lawrence (2002), hybrid courses are a blend of face-to-face instruction and online learning that satisfy students' need for convenient course offerings while making the best use of facilities, faculty resources, and online teaching technologies as the amount of classroom seat time is reduced. Even though traditional classroom methods continue to be important in learning, the use of technology helps to refocus how student needs are met (Lawrence, 2007).



EMPOWERING LEARNERS AND EDUCATORS – VIDEO FEEDBACK TO WRITTEN ASSIGNMENTS

Ann-Sofie Karlsson, Tobias Ruhtenberg, The University of Borås, Sweden

Introduction

A challenge for teacher education in Sweden today is to find new ways of working in which the degree of media and information literacy of the teacher educators is high. Such renewal of teacher education is becoming more and more necessary to equip our students for the challenge of today's digitized school. As part of this we have, in the teacher education programme in Borås, tried to provide students with visual feedback on written work.

Based on our own teaching experiences and practice oriented studies, we want to share our experiences of working with video feedback in higher education in order to improve communication between teacher and student in connection with feedback on written work. This kind of feedback has been found to function well and appreciated by both campus and distance teacher students, as well as being a means of peer support between students. Unlike traditional written feedback, video feedback has been found to be clearer and more accessible to the recipient and at the same time does not increase the teacher's workload. Our own experience of working with the tool corresponds with research such as by Stannard (2007; 2008a, 2008b) and Mathiesen (2012) done in this field which shows significantly better understanding by students of video feedback compared with traditional written feedback. This paper aims to inspire and arouse interest in new ways of using educational technology within various professions, but also demonstrates the relevance of this approach in traditional teaching as well as online teaching where video feedback may contribute to strengthening social contact and clarify communication between students and teachers. Our hope is to demonstrate that by using video feedback with simple means teachers can develop and include technology in higher education.

In the past three years that we have worked on this practice based research field, we have on several occasions presented updated results from our own and other studies, both in the form of workshops and panel presentations. Examples of conferences in which we participated with our own material are NGL (Next Generation Learning) University of Dalarna Sweden, Noralf (Nordic Network for action research) University of Gothenburg, the INCLUDE (National Network for widening participation in higher education) University of Borås, Sweden and NU (the largest higher education conference for networking and development), University of Gothenburg, Sweden

Background

The methods of feedback on written assignments in higher education, which normally take the form of handwritten comments or digital comment fields are not always as effective as they should be. It is often difficult for students to understand the content of the comments while it is a challenge for the teacher to convey a clear message in writing. Students often need the teacher's help to decipher the feedback. It may mean that students who are in need of extended assessment do not receive the support they will need to develop and understand how to move forward with their learning. Feedback is in these cases not sufficiently clear (Ivanic, Clark & Rimmershaw, 2000). According to a *National Union of Students* (NUS) survey in 2008 of English students, the lack of good feedback was considered to be one of the most important areas in need of development. The lack of clear communicative feedback between teacher and student is clear, and we are well aware that the feedback given to students in many cases is unclear and often misunderstood. Additional explanations and clarifications take time from the teacher and create frustration for the student.

According to Stannard (2007), there are few students who care about and embrace written feedback from their teachers. It may be that students do not understand what the teacher says or that the feedback is contradictory. Fregeau (1999), has demonstrated that students who received feedback on their written assignments didn't acquire new skills by means of the written comments. They mostly copied teachers' comments in their own text and then submitted the new version of the assignment. Sometimes it resulted in their texts becoming more difficult to read and incoherent because the students did not reflect on why they made the changes.

We are experiencing a growing interest from colleagues in higher education for knowledge of, as well as the chance to test video feedback in their work. This has led to our interest in working with and developing the method. It is necessary for educators to keep up with the digital revolution, because digital tools today are an integrated part of the classroom. Three years ago we saw the need to change the way we provide students with feedback and an opportunity arrived when we both heard about video feedback at two different conferences and then had the opportunity to develop the method at our own university.

Video feedback as an important part of formative assessment

According to Boud (2012), everyone involved in teaching and assessing students should shift their focus from what students have done to what they can do. This means that teachers must change their focus from seeing assessments from a teacher-centred perspective to a learning perspective. Furthermore Boud suggests that assessment and feedback should be changed from assessing knowledge to providing opportunities for learning. In order to examine ways of developing methods for feedback and assessment of students' examinations, higher education needs to develop and test new methods. One of these methods is discussed in this paper and is intended to illustrate how ICT can support teachers' communication with students.

The use of formative assessment is under discussion in higher education, both in Sweden and internationally, but the research available is still concentrated on primary and secondary schools. Research on formative assessment by Wiliam (2013), suggests that a mixture of summative and formative assessment undermines the conditions for learning by the student. Teachers should not both assess and give feedback on the same document if maximum learning is to be achieved in an examination. Often, it is the quality of feedback that determines when students can proceed. According to Hattie and Timperley (2007) feedback to students is the most powerful aid to new knowledge. Feedback can be understood as both positive and / or negative. It is the way feedback is given that will determine how the student receives it. The most effective feedback is that which is based on past knowledge. With the help of qualitative feedback the student can reach a higher potential for further studies.

Strengthening formative assessment by using video feedback will hopefully result in a better quality of teacher feedback on submitted written assignments. According to MacGregor et al. (2011), formative assessment gives the student a better position to learn. Nicol and Macfarlane (2011) describe formative assessment in higher education as a way for the student to independently understand their learning. In this way the student gets a better picture of what he or she can do to improve their strategies and ultimately achieve better results in their studies. At the same time a discussion is needed on how feedback from teachers should be improved so that the student best achieves self-regulatory or self-directed learning. Since both assessment and feedback are important factors for both teachers and students in higher education, there must be opportunities for feedback to act as a learning opportunity. This means that summative teacher assessment of student performance alone will not help to provide the understanding needed for students to move forward. With the help of digital technology and mediating tools new possibilities are created for improving formative assessment.

Technical requirements

For the increasing number of lecturers who see the need and want to learn more about using video feedback in their profession, it is important that an experienced colleague can guide and give opportunities to test the method and ask questions. Fear and uncertainty surrounding the use of technology is what we perceive as the biggest obstacle to getting started, but once these fears are overcome technology is perceived as a much appreciated and useful working tool.

The technology is easy to adapt and it only takes a thirty minute introduction to learn how to handle the tool. In addition to a computer, a headset improves sound quality. For uploading the video file the user needs a Youtube, account, Vimeo or their own streaming server. Once the film is recorded a fast connection for uploading to the video account you have selected is needed. There are different software options available to record the feedback, such as Jing Screencast -O- Matic, Screen Flow, Snagit. The choice of which one to use is determined by the user's needs and the features that are needed for different applications. The teacher can also choose whether to record using a webcam so that the teacher's face appears in a corner of the finished film.

Before the teacher records the feedback the written assignment (written / paper / exam etc.) is opened on the computer. The file is displayed on the screen. Next the teacher can then choose to colour highlight sections of text to comment later, or start recording instantly and comment gradually as the recording is in progress. The teacher chooses for example to show how sentences that are not correctly constructed can be improved and changed by correcting them and at the same time talk about the changes that are implemented in the text.

Once recorded, a movie file is created that the teacher can upload to a Learning Management System or video services such as YouTube or Vimeo. The links to the recordings are forwarded to every student who is to receive feedback from their teacher. The films that are uploaded to You Tube are hidden from the public by the teacher by saving them as “unlisted”. Thus they are not searchable and can only be accessed for those who have received the link, which means that no films are available for public viewing.

Useable areas for video feedback

The use and development areas for video feedback that we foresee are for example communication between teacher-student, feedback on examinations and reports and thesis supervision, second language instruction, as well as e-mail replies. In other words in all forms of written communication. Video feedback is suited for online teaching; an asynchronous teaching method when the transmitter and receiver themselves choose the time of recording, and viewing. In distance education there is often a lack of natural social presence, which can be compensated by the personal touch or feeling that is created in video feedback. We also see a development possibility of using this method for increasing the contact between teacher and student.

One reason for the increased desire for video feedback is that oral communication can discern nuances that are not achieved in written communication. In addition, feedback given through speech becomes more comprehensive and clear than feedback given in writing. In the context of language teaching video feedback clarifies the nuances that are important when learning a language, which are difficult to explain in writing only. Differences in tone, for example, help the student to understand what is more or less important in feedback.

In our work with digital video feedback we have received many comments from teachers suggesting that one advantage of giving video feedback is that all students receive the same attention, rather than just those students who have major problems. Furthermore teachers experience that the feedback given to the students has more nuances and contains more comprehensive information than traditional feedback. At the same time, students describe how video feedback has helped them to understand the teacher's comments better because they both see and hear what the teacher wants to convey. An additional benefit with video feedback is that students can fast-forward and rewind the recording and thus take the time needed to reach a better understanding.

Conclusion

In summary, it is clear that video feedback leads to an increased understanding of the comments and feedback given to students. Students experienced the method as a well-functioning tool in their own learning process. This can be seen as a way of developing the formative assessment of written language development in higher education, thus contributing to increased quality of feedback given as well as the quality of the student's final text. If video feedback in the future becomes a tool in teachers' everyday work the ability to help students, with for example, reading and writing difficulties is also increased. Foreign students are also better helped by the method, an important factor today when university education has a diverse student group to work with. In this respect we foresee further uses of video feedback, such as students themselves using the tool in their communication with the teacher. To introduce and develop this within our profession is something we look forward to continue working with.

In online education, video feedback can be an effective way of making the contact between students and teachers feel more personal. Distance education is often considered a form of education in which students do not feel that they are part of social community. Video feedback has proven to be a great way of increasing students' sense of a closer contact with the teacher and many students report that they feel that spoken comments from the teacher are much more personal than written. Comments suggest that students feel that rather than being of a general nature feedback is directed solely to them. According to students, the understanding of feedback is improved when they can both hear the teacher's voice and see what teacher does on the screen. The tone found in spoken language is difficult to transfer to text and it is an aspect that the students emphasize as important.

Video feedback technology can also be used by participants in online courses as a form of examination for example in foreign language teaching in which participants record screencasts where they read texts in the foreign language. The teacher can then get an idea of the student's linguistic ability in both text and pronunciation.

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TIME TO ASSESS LEARNING OUTCOMES IN E-LEARNING – TALOE WEB TOOL

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Abstract

TALOE (Time to Assess Learning Outcomes in E-learning) is a two-year project co-funded under the European Commission's Lifelong Learning Programme, approaching the e-assessment concept by using technology for assessing students' learning.

TALOE's main goal is to develop a web-based platform to help teachers and trainers decide which e-assessment strategies to use in their online courses. This tool is aimed to raise teachers' awareness about the variety of e-assessment strategies in order to improve the quality of the learning process. The main idea is that teachers will describe the learning outcome of their course or module and the TALOE platform will analyse them and provide a suitable e-assessment strategy that is consistent with the intended learning.

In this paper achieved results in the project so far will be presented, with the emphasis on the development of the TALOE web tool.

TALOE project: Time to Assess Learning Outcomes in e-learning

The project *Time to Assess Learning Outcomes in E-learning* – TALOE (taloe.up.pt), is financed by the European Commission for the years of 2014-15 (Ref. 543097-LLP-1-2013-1-PT-KA3-KA3MP).

The TALOE consortium consists of the following institutions:

- *Universidade do Porto* (Portugal) (coordinator)
- *Gábor Dénes Főiskola* (Hungary)
- *Sveučilišni računski centar Sveučilišta u Zagrebu* (SRCE) (Croatia)
- *Innovate4Future – Center for Advanced Educational Solutions* (I4F) (Romania)
- *Università degli Studi di Padova* (Italy)
- *European Distance and E-Learning Network* (EDEN)
- *European University Continuing Education Network* (EUCEN)
- *Hariduse Infotehnoloogia Sihtasutus* (HITSA) (Estonia)

- *Universidad Nacional de Educación a Distancia (UNED) (Spain)*

The project builds on the foundations of two previous projects:

- an existing model for the Alignment of Learning Outcomes and Assessment, the ALOA model, which uses the revised version of Bloom's Taxonomy to establish the link between the Learning outcomes and general assessment methods (Anderson, Krathwohl & Bloom, 2001; Falcão, 2013). The TALOE project uses the same methodology but by adapting it to the specific context of e-learning and e-assessment.
- the outcomes of the VIRQUAL project (<http://virqual.up.pt/>), in particular the template for describing the learning outcomes (Csanyi & Yilmaz, 2009)

The TALOE project intends to materialize the application of the ALOA tools to the specific context of e-learning. The main goal of TALOE is to develop a web-based platform to help teachers and trainers decide on the e-assessment strategies to use in their online courses. The rationale of TALOE is that a teacher/trainer will describe the learning outcome of the course or module and the TALOE platform will analyse them and provide an e-assessment strategy that is consistent with the set of intended learning outcomes.

In the process of the development of the practical tool the TALOE consortium is performing the following specific tasks:

- Research and selection of innovative e-assessment practices that take advantage of the use of technology.
- Development of a web-based tool that is easy to use by the stakeholders.
- Testing of the implementation of the tool with real case studies.

Along with development of the web tool, the project has established the web pages where all the information about the project is available to community (taloe.up.pt). The project web pages also provide the resources related to the project objectives: learning outcomes, assessment methods and so on. Information about the project is disseminated through the TALOE mailing list and presence on the social networks. Additionally, three leaflets have been published till now and distributed to the academic community, especially at the project partner institutions. The new leaflet is due in the middle of the April. The project newsletter has been published periodically as well and brings the information about the project current progress and achieved results.

During the project the important task is to establish the network of the people and institutions interested in the project results, and to identify and reach the potential stakeholders interested in the project who will use the benefits of the project in order to promote it and implement it in the academic community as the valuable tool in the process of education quality improvement.

Background and conceptual framework

Assessment is a crucial process in education. To be valid, assessment should be consistent with the intended objectives of learning activity. The learning process is very complex in all its components: clear definition of the intended student learning outcomes, definition of adequate learning activities and selection of assessment practices that address what is expected from the students. The use of e-learning in learning and assessment brings an additional level of complexity to the process. TALOE intends to provide a practical web solution to some of these issues, based on tools developed previously.

Learning outcomes have been widely adopted in education with different roles. They were used to describe the competences of the individual after the training, with the goal of improving the dialogue with potential employers. The adoption of learning outcomes in higher education in Europe is associated with European policies with impact on national policies and on higher education institutions and are usually interpreted as what a student is expected to be able to do as a result of a learning activity. There are different roles or applications for the learning outcomes:

- a descriptor of the qualifications acquired for improving mobility and employability of individuals;
- a descriptor in processes of recognition of prior learning for improving access to education institutions and validation of competences;
- a criteria for quality assurance systems and accreditation processes of higher education institutions;
- a structuring role in educational systems, used as descriptor used in qualification frameworks at international, national and sector levels;
- a structuring role at the institutional level, used as a multi-level descriptor in programmes inside the institutions;
- a communication tool between teachers and learners, as a descriptor of the goals of a course or unit.

Learning outcomes are also becoming fundamental for structuring the standards and guidelines of quality assessment of higher education and continuing education institutions in Europe and worldwide. In this context, the assessment of learning outcomes becomes a crucial process for the educational system. It should be a major concern of educational institutions to ensure that assessment of student learning is being guided by what they should be learning, i.e. assessment should be consistent with the intended learning outcomes.

Concerning e-assessment, it is considered that is a critical part of e-learning, the same way assessment is critical to traditional learning. The general concept of e-assessment is herein broadly defined as using technology for assessing students learning. Furthermore, the impact of information and communication technologies (ICT) on education has to be taken into account. The use of ICT applied to education, e-learning etc. has been increasing and its use creates new opportunities for teaching, learning and assessment and has huge potential as an answer to some of the current challenges of education. The change to the digital media has

impact on the availability, reusability, accessibility and cost of learning resources, complemented by the communication and networking potential of the Internet that takes education to a global level. The application of ICT in education and in particular in assessment is a subject of great discussion. Some of the issues related with the use of e-learning in assessment are related with validity and reliability of the process.

For the alignment of learning outcomes and e-assessment, TALOE has adapted and developed another tool, the ALOA model. The ALOA conceptual model (Aligning Learning Outcomes and Assessment) highlights the connection between the intended learning outcomes and the assessment strategy used during a course. To ensure the validity of assessment in relation to what is intended from the course, it is necessary that the outcomes measured by the assessment tasks are the same as the ones expressed in the learning outcomes statements. This is the main principle that supports the ALOA model. It uses the revised version of Bloom's Taxonomy to establish the link between the learning outcomes and following six general assessment methods each with subcategories:

- multiple choice question;
- essay;
- problem solving;
- practical work;
- short answer questions;
- reflective practice assignments.

The final lists of these methods were obtained from the literature research (Anderson, Krathwohl & Bloom, 2001; Biggs & Tang, 2007; Bloom, 1956; Boud & Falchikov, 2006; Falcão, 2013), especially from Brown, Bull and Pendlebury (1997). It was considered that the list includes most assessment methods but it is assumed that there are assessment tasks that might not easily be included in these categories.

The ALOA model also proposes different scenarios of application that allow the model to be used to verify the consistency of the courses or to propose new assessment strategies that are linked with the learning outcomes statements of the course or module. It is a fact that not all assessment methods are valid for each type of the learning outcomes. The ALOA model provides tools for linking learning outcomes and assessment tasks.

E-assessment practices: selection and analysis

In the first project year the project was at a stage where the activities were targeted at identifying and defining selection criteria for innovative and effective e-assessment practices. Instead of listing different methods the focus was on things that trigger a shift in what is actually assessed, how it is assessed and discard practices where the only aspect which is “innovative” is the method itself. These shifts can be generally described as follows:

- a shift from the testing of discrete, de-contextualised elements of knowledge and skill to the assessment of more holistic, complex activities using knowledge and skills in problem-solving or authentic tasks;
- a shift from highly standardised and controlled testing methods which result in quantitative scores and where assessment is strongly separated from teaching and learning to a more diverse range of assessment methods, resulting in qualitative descriptions or judgements and where assessment is often integrated with teaching and learning and may involve students as active participants;
- a shift from identifying and categorising underlying ability or ‘intelligence’ and ranking student performance in relation to their peers to identifying and describing achievements according to relevant criteria and standards.

In order to identify suitable criteria matching these shifts it became evident that the emphasis had to be placed on concentrating on more general approach starting with the assessment type. This meant eliminating criteria associated with “norm-referenced assessment” practices and focusing on criteria that characterise “criterion-referenced assessment” practices, i.e. casting aside situations where assessment is based on making judgements about people (e.g. ranking students based on distribution of scores) and instead concentrating on judgements about performance (e.g. assessing the extent to which learning outcomes are met). And only then considering other aspects such as the assessment methods which might be deemed innovative (using concept maps, wikis, portfolios, learning analytics, simulations etc.). Based on the above and following the Standards and Guidelines for Quality Assurance in the European Higher Education Area (ENQA, 2009), an initial list of criteria for identifying innovative assessment practices was drawn up.

The result was collection of 18 cases of assessment of online courses from different institutions around Europe, mostly from the project partners (Lössenko, 2014). These case studies were analyzed by the partnership in terms of classification under two perspectives: these were classified in terms of learning outcomes definition and in terms of the assessment modes used to verify these learning outcomes. The case studies classifications were also revised by the partnership during a second round.

The goals of this work were to obtain examples of case studies that can be used as a showcase of current practice and also as testing material during the second year of the project (see, for example, Gil-Jaurena, Aguado, Malik & Cucalón, 2015). Since these case studies are available to the partnership these can be scrutinized during the tuning of the web-tool. Another result refers to the ALOA model with integration of e-assessment practices, which was developed on

a second stage of the research component where the consortium developed an extension of the ALOA model to include the e-assessment practices described in the case-studies. This outcome generated the list of e-assessment methods to be considered in the web-tool.

Web-based tool

After the definition of the extended ALOA model and setting of the matrix which is aligning the cognitive processes describing the learning outcomes and the categories of the e-assessment methods the next step was to develop the web-based platform that will help teachers and trainers decide on the e-assessment strategies to use in their online courses. The main idea for development of this web tool was that a teacher will describe one learning outcome of their course or module and the TALOE web tool will analyse it and offer the most appropriate e-assessment methods that are consistent with the intended learning.

The first task was to define the matrix behind the tool. The matrix is aligning the six categories of the cognitive process dimension and relative cognitive processes with defined six categories. The categories of cognitive process dimension range from the cognitive processes most commonly found in learning outcomes, those associated with Remember, Understand and Apply to those less frequent like Analyze, Evaluate and Create. Each of these six major categories is associated with two or more specific cognitive processes, also described by verb forms.

The partnership has produced a first version of the web-tool at the beginning of the year 2015 and started with testing for the first functionalities of the intended platform (Figure 1). The development and consequent testing will be done in phases of complexity of the definition of the procedures relating learning outcomes and assessment methods. This is an extra effort to achieve consistency of the web-tool performance and simplicity of procedures by potential users. Due to the complexity of the ALOA model it was decided to simplify the tool procedures during a first phase of testing it. The first phase addresses only the simplest forms of knowledge. After initial testing of the matrix it has been confirmed that the matrix is working properly. The best (most appropriate) e-assessment methods are selected on the base of the absolute matches between input (learning outcome) and the e-assessment method.

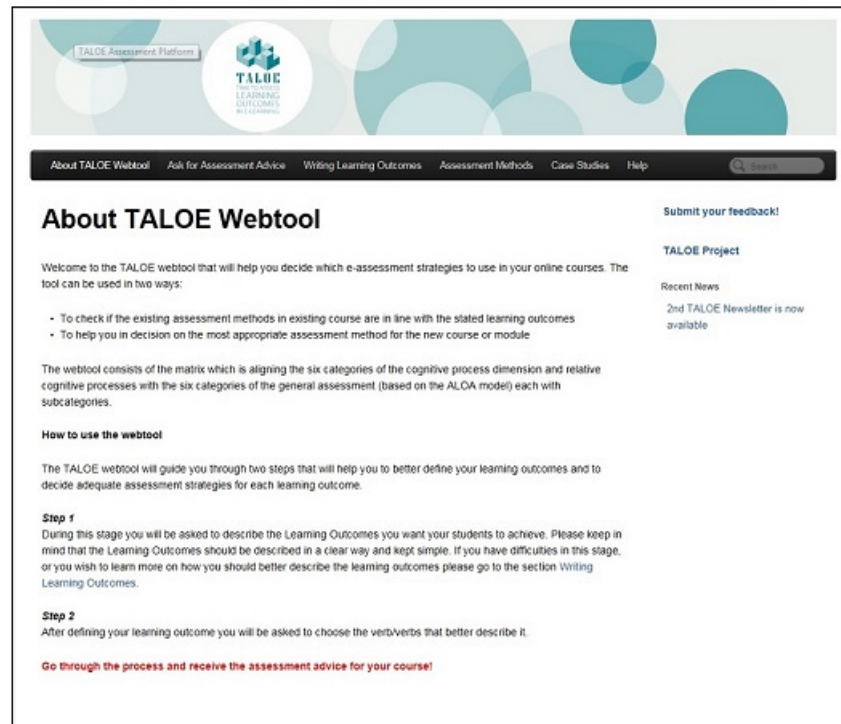


Figure 1. Main page of the TALOE web tool (taloe.innovate4future.eu)

Further testing was done with collected case studies to see if the suggested e-assessment methods are closely related to defined learning outcome. The results showed that the majority of the teachers have planned assessment methods such as: forum discussions, written assignments and online tests, self-evaluation tests and some practical activities. The suggested e-assessment methods (by TALOE web tool) in some cases suggested additional possibilities of the assessment but in some cases indicated that the existing assessment methods should be revised.

These results confirmed intended and planned task that the web tool also provides support and guidance to teachers to formulate the learning outcomes in accordance to Bloom taxonomy increasing this way the accuracy of the learning outcome received by tool.

When describing the learning outcome, teacher chooses up to three verbs that will best describe the learning outcome. This step also enables the user to check the defined learning outcome. After describing the learning outcome with verbs, teacher set the process in action and receives the assessment advice for the defined learning outcome (Figure 2). The tool also provides the description of each suggested e-assessment methods. The basic info about the learning outcome and the ALOA model are available as well. So, the TALOE web tool can be used in two ways: to check if the existing assessment methods in existing course are in line with the stated learning outcomes and to help user in decision on the most appropriate assessment method for the new course or module.

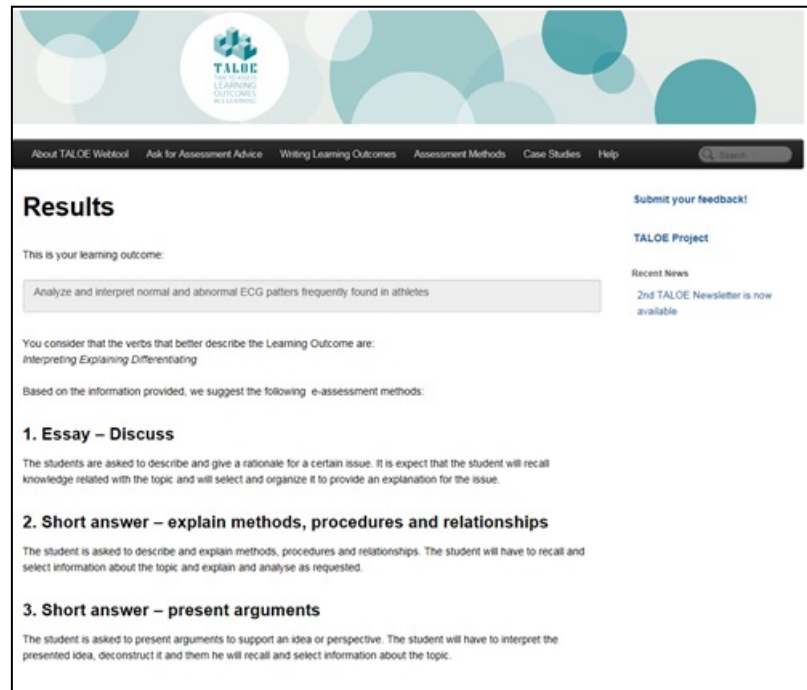


Figure 2. TALOE web tool – results page

At the moment in the process is testing by invited stakeholders to get their feedback on the relevance and usability of the tool. Based on their comments and information additional adjustments of the tool will be made.

The aim is to develop an interactive website that will provide a service to teachers and trainers of different learning context. It is intended that the TALOE web tool will be freely available to use publicly and will be of help to any person concerned in finding the solutions for assessment.

Conclusion

The second year of the project plans to focus on the two remaining objectives of TALOE:

- to test the implementation of the tool with the set of collected case studies and with other case studies from other courses;
- to distribute, to disseminate and to explore the TALOE web-tool among the communities of stakeholders.

Following the testing of the web-tool by the partnership and invited stakeholders, the plan is to adapt the web-tool to the decisions. Also some organizations and experts will be directly contacted and invited to cooperate in this testing. It is relevant to consider the increase of the accuracy of the tool, the interface with users, the cultural diversity, the language issues and the scope of users. After that adaptation and improvement the web-tool will be tested on a wider scale using the networking and the partnerships established. The final phase, envisaged for the last quarter of the year, will be dedicated to reach a larger audience in terms of dissemination and of exploration of results.

Some activities are related with dissemination and exploration like:

- collection of related news to be published on the project and partners' websites and in social networks;
- contacting directly stakeholders that are related decision makers, accreditation organizations, qualification bodies and quality assurance agencies;
- elaborating newsletters and leaflets that will be distributed via the partners' lists and via the engaged organizations;
- organization of TALOE webinars on the monthly base (third Wednesday at 11 o'clock CET);
- publication of papers in conferences and in journals with the results arising from the project implementation;
- organisation of a conference with an intended European audience aiming at presenting the web-tool.

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