

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

**Eighth EDEN Research Workshop – EDENRW8**

**Challenges for Research into  
Open & Distance Learning:**

Doing Things Better – Doing Better Things

Oxford, United Kingdom

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**CONFERENCE PROCEEDINGS**

Edited by

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

EDEN, 2014

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

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**Challenges for Research into Open & Distance Learning**  
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## Introduction

One of the important missions of EDEN is to support the development of academic research by facilitating its wide scale dissemination, promoting international networking, knowledge sharing and exchange of academic and professional experience. This is a critical role in a rapidly evolving scene. The EDEN conferences are major academic and professional events in Europe, based on collecting best practice and breakthrough innovations, serving with the papers presented and published as well as media records of the discussions held as most valuable resources for the professional community.

High quality research into open learning is indispensable in face of today's challenges. It provides important information to enhance learning with technologies in the digital age, improving and enriching the learner's experience, to assist effective decision-making and foster the uptake of promising educational innovations, and helps to ensure the viability and quality of products and services. This is vital in a field where change is constant. The continuing significant interest from the professional community has been confirming for 15 years already the relevance of the EDEN initiative to run the Research Workshops which represent the bi-annual meeting place for the leading European and global research for open and digital learning.

This year's Workshop Scope reflects upon the current complex challenges facing researchers and the intersection of their work with 'doing better things' for key stakeholders. This includes informal learners, formal learners, teacher, leaders, funders and policy makers especially where new learning technologies play an important role.

EDEN is proud that the Open University, as a founding member of the Association since 1991 is hosting and sponsoring the event. The OU has been a world leader in modern distance learning, pioneer of teaching and learning methods which enable people to achieve their career and life goals studying at times and in places to suit them. With their support, the 2014 Research Workshop is held in Oxford.

The format of the event is key for setting a unique environment. The EDENRW8 will be very focused on the researchers and what they can learn from and with their peers. This year the program design is not like that of the usual conferences. Networking occurs as an essential aspect of the experience, featuring small groups for deep dialogues, feedback on your research, 'research-speed-dating' papers, poster session, world café style facilitation and presentations along with keynotes.

Two challenge areas have been identified which shaped the EDENRW8. They are: Challenges for open and distance learning in 21st century and Challenges in undertaking research and research impact. The top themes selected were: Researching Learning Design for the 21st Century skills, Open and Distance Learning for Employability, Researching 'the Crowd' in a mass learning in a global society and Researching 'the Group' and social Learning and the independent learner in ODL. New or recast models and methods for researching learning

design: Learning Analytics is high on the agenda – how can we use big data research: to evaluate open and distance learning? How do we measure and how can we increase the impact of our research into ODL?

The EDEN Best Research Paper Award has become an important part of our conferences and Research Workshops since it was first introduced in 2008. EDEN acknowledges and appreciates the continuous support of the Ulrich Bernath Foundation for Research in Open and Distance Learning in the selection of the most outstanding research papers, thus highlighting excellence in our community.

András Szűcs  
Secretary General

António Moreira Teixeira  
EDEN President

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## **FACULTY ROLE CHANGE: ADJUSTMENT TO THE INFLUENCE OF ONLINE TEACHING AND LEARNING**

*Martha Cleveland-Innes, KTH Royal Institute of Technology, Sweden, Athabasca University, Canada, Sarah Gauvreau, Contact North, Canada*

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### **Abstract**

This paper presents an argument which rests on two interrelated premises regarding the influence of new pedagogies in higher education. The first is that the phenomenon of web-based teaching and learning is dramatically affecting faculty roles in higher education. The second is that the role of faculty member is saturated with requirements and adding a teaching process that requires advanced teaching expertise and additional time commitments will not fit into the current role of faculty; this is so for web-based teaching and learning. Survey data from seventy-seven faculty from eighteen comprehensive academic institutions in Canada provides evidence of change in faculty views and activities in refer to teaching, whether faculty are engaged in teaching with technology or not.

### **Introduction**

Technological advancement has a dramatic effect on every-day life in contemporary society and its many social institutions, from the workplace to entertainment. Higher education is not immune to these changes, but the exact impact, nature and scope of changes is still unclear (Gumport & Chun, 2005). According to Keller (2008), changes in many things including technology “constitutes [sic] the most consequential set of changes in society since the late nineteenth century, when the nation went from a largely domestic, rural, agrarian mode of living to an industrial, international, and urban economy” (Preface xi). Consequently, for higher education, “this set of circumstances is going to force all academic enterprises to rethink their place and purpose not just in philosophical terms but in very pragmatic ways as well.” (Beaudoin, 2003, p.520). In the past two decades, higher education has, if not embraced new technology, reached out to utilize the Internet and other forms of technologically-mediated learning. This has transformed interaction opportunities among students and between student and faculty, particularly through online learning.

Online learning offers the opportunity to examine and rethink the teaching and learning enterprise in education broadly. Online learning can be conceived of as the new pedagogy, where strategies such as interaction and dialogue are introduced back into the higher education model. Regardless of education delivery mode – face-to-face, online, distance or

some combination through blended learning – teaching (and learning) is changing. Key to this change is the new ways of being as a teacher in higher education – a central part of the role of faculty member in universities. The additional duties, responsibilities, and changing role of faculty can create a high level of dissatisfaction, particularly if they feel they are not well supported (Satterlee, 2010).

This segment of the study is guided by the following research question:

- To what extent, if at all, has the existence of online teaching and learning shaped, if at all, the role and nature of teaching for faculty in higher education.

## **Background Information**

It is unrealistic to expect higher education faculty to have sound, current, content expertise, a productive research program, an active service commitment and be expert online teachers. The biggest lie in the academy is that the role of faculty, and its rewards and responsibilities, is made up of a seemingly balanced set of activities around teaching, research and service (Atkinson, 2000). With some variation across type of institution, research is the most valued work and most notably rewarded. While this reality has not changed “... classroom teaching and course materials (have become) more sophisticated and complex in ways that translate into new forms of faculty work. ... such new forms are not replacing old ones, but instead are layered on top of them, making for more work.” (Rhoades, 2006, p.38). It is time to clarify this reality and consider how, if at all, changes in teaching are, or may be, integrated into the role of faculty member.

This social agenda supports improvements in education access and quality learning experiences afforded by online education delivery. Online learning involves the use of the Internet for interaction and collaborative engagement previously unavailable to teachers and students. What changes are required to the role of faculty member to allow engagement in online teaching? Any effective teacher must be true to the learning objectives of the subject-matter at hand while attending to the multitude of characteristics students bring to the experience. Effective teachers bridge content and student needs through appropriate student engagement; a tactic as old as education itself. The role of effective teacher in online learning environments is newer and more complex. Even more complex are the implications of adopting the new teaching requirements into the current role of faculty. Knowledge from this research project will help make decisions about realistic expectations of the role of faculty and how much, and how fast, changes may be made in teaching. All the teaching development and technology training in the world will not realize significant quantities of teaching change, even for the most motivated to do so, until the context changes to support and reward teaching in ways that it has not in the past and, in addition, support the increased requirements for teaching activity using new technology.

Even before the imposition of new technology, both excellent teaching and excellent research records were difficult to achieve. Fairweather’s (2002) research suggests that new ways of

## **Faculty Role Change: Adjustment to the Influence of Online Teaching and Learning**

*Martha Cleveland-Innes, Sarah Gauvreau*

teaching will make it more difficult for faculty to be exemplars of research and teaching. This study examines the myth of the “complete faculty member” – that is one who can sustain high levels of productivity in both research and teaching at the same time. Data from the 1992–93 National Survey of Postsecondary Faculty provided a representative sample of 29,764 part-time and full-time faculty in 962 American research universities, doctoral-granting universities, comprehensive colleges and universities and liberal arts colleges. For the purpose of that study, Fairweather identified faculty as highly productive researchers if refereed publications exceeded the median for program and institutional type over a two year period. Faculty members identified as highly productive teachers were those above the median in student classroom contact hours. In the first instance, 22% of faculty in 4-year institutions met both criteria. However, adding collaborative instruction to the teaching criterion reduced the percentage of highly productive researchers and teachers to about 6%.

This time consuming collaborative instruction is central to the benefits of online teaching and learning. The individualization of communications, and the role of instructor as a facilitator of student participation and learning, add to instructor workload when teaching online (Davidson-Shivers, 2009). A central advantage of online delivery is the opportunity to better engage learners in more active and collaborative educational experiences. Tomei (2004) proposes that online student expectations for on-demand, continuous feedback necessitates smaller class sizes relative to those in traditional classroom instruction. This is one option available to compensate for the imposition of time online teaching will impose. For Tomei, the 40-40-20 formula for allocating faculty time (40 percent teaching, 40 percent research, and 20 percent service) suggested by the American Association of University Professors (AAUP) is unrealistic for faculty teaching in an online environment.

As well as adjusted teaching practice, support for new online students requires adjustment for the instructors in reference to the learners. For example, one instructor said “I actually prefer online teaching because it can take time to think through responses to students, um, and you can do it on your own time, your own speed. So in other words, what’s good for students in terms of asynchronous is I think good for instructors as well.” This provides new views to the role of online teacher. In addition to these insights, we had further access to the instructor experience when we studied the need for instructor support in relation to student adjustment (Cleveland-Innes & Garrison, 2009). Instructors were very forthcoming and descriptive about the many things that had to be learned and implemented in order to teach in the highly interactive and collaborative online environment. These anecdotal findings generated a great deal of discussion and excitement about challenges experienced in the transition to online instructor – and the adjustment to such a role. These new insights were synthesized and presented (see Cleveland-Innes, Sangra & Garrison, 2008).

This research builds on earlier findings. The central objective is twofold. Academic instructors, those teaching online and those who are not, will have the opportunity to describe the details of his or her teaching role under current conditions. Those not teaching online will describe what teaching online looks like from the position of observer; what challenges, limitations, benefits and interests are present for them. Most importantly, they will be asked to

consider how they imagine such a change may be integrated into current teaching practice; i.e., how would online instruction change their role as teacher? This will be repeated for those already teaching online. Those already teaching online will describe what teaching online is like from the position of participant; what challenges, limitations, benefits and interests are present for them. They will be asked to explain how such a change, if it is a change, was integrated into past teaching practice; how does online instruction change their role as teacher? We will also ask faculty how the existence of online teaching and learning is changing, if at all, the role of face-to-face teacher.

## **Data Collection and Analysis Methods**

A mixed methods approach was used to collect data from fixed-choice and open-ended questions utilizing an online survey. The online survey consisted of 5 demographic questions, 3 open ended questions, 47 likert-scaled statements and 14 closed questions.

## **Findings**

A total of 77 faculty from 13 different institutions in all Canadian regions completed the online survey. Sample demographics identify 62 full time faculty, 9 part time faculty, and 6 contract instructors from seventeen different disciplines. Thirty-one or had taught at least two sections of a course fully online (80+% of the content delivered online). Seventy had experience using the Internet for instruction that included more than email and/or posting course outlines on the Internet. Table 1 identifies the range of post-secondary teaching experience in years.

Table 1: Years of Experience Teaching Post-Secondary

11	0-5 years experience
19	6-10 years experience
18	11-15 years experience
08	16-20 years experience
11	21-25 years experience
10	26+ years experience

Only a portion of the data will be presented here; further analysis will occur for presentation in October. Table 2 outlines responses to statements about current and future use of online delivery.

## Faculty Role Change: Adjustment to the Influence of Online Teaching and Learning

Martha Cleveland-Innes, Sarah Gauvreau

Table 2: Perspectives on Online Delivery

	<b>Strongly disagree</b>	<b>Disagree</b>	<b>Neutral</b>	<b>Agree</b>	<b>Strongly agree</b>	<b>Total</b>
Online education is critical to the long-term strategy of my school.	7.79% 6	7.79% 6	9.09% 7	<b>38.96%</b> 30	<b>36.36%</b> 28	77
Open educational resources will be of value for my campus.	1.32% 1	1.32% 1	<b>14.47%</b> 11	<b>46.05%</b> 35	<b>36.84%</b> 28	76
Online education is significantly represented in my institution's formal strategic plan.	7.79% 6	<b>15.58%</b> 12	<b>32.47%</b> 25	<b>36.36%</b> 28	7.79% 6	77
There is increasing competition for online students in higher education.	0.00% 0	4.00% 3	<b>33.33%</b> 25	<b>44.00%</b> 33	<b>18.67%</b> 14	75
Faculty at my school accept the value and legitimacy of online education.	10.39% 8	<b>25.97%</b> 20	<b>32.47%</b> 25	<b>24.68%</b> 19	6.49% 5	77

Forty per cent of respondents are considered experienced online instructors (defined as having taught at least two sections of a course 80+% of the content delivered online. When asked, "Do you feel the phenomenon of online teaching has changed what you do as a faculty member?" 89% said yes, 11% said no.

Table 3 outlines thematic areas of change faculty identified when asked "If yes, in what way(s)?" as a follow-up to the question answered above.

Table 3: Areas of Change

Teaching	30%
Learning	22%
Content	20%
Materials	16%
Assignments	15%
Face to Face Interaction	13%
Use of Video	9%
Students Expectations	7%

## Discussion

Our country-wide sample includes respondents a wide range of post-secondary teaching experience and a wide range of disciplines. Close to half have experience teaching online courses. Those who haven't taught online report using the Internet for pedagogical support for courses delivered face-to-face. Almost all respondents report changes to their teaching because of online learning, and identify most aspects of course design and delivery as areas undergoing change.

In response to the statement "online education is critical to the long-term strategy of my school," 75% of respondents agreed or strongly agreed. In spite of this strong response, only 42% agreed or strongly agreed to the statement "online education is significantly represented in my institution's formal strategic plan." Competition for online students is seen as on the rise for 63% of respondents, but only 30% agreed or strongly agreed to the statement on value and legitimacy of online education; "faculty at my school accept the value and legitimacy of

online education.” Related to the delivery of online education, the statement “open education resources will be of value on my campus” received 80% agreement.

The vast majority of respondents (89%) said yes when asked “do you feel the phenomenon of online teaching has changed what you do as a faculty member.” When asked what changed, text responses ranged for teaching strategies (30%), learning perspectives (22%), and content (20%). This applies whether respondents are teaching online or not. Changes to instructional materials and assignments were noted often. Other pedagogical elements of interaction, use of video, and expectations were also noted multiple times by separate respondents.

## **Conclusion**

These findings support the premise that pedagogical change is widespread in Canadian post-secondary education and is likely to continue. This paper presentation focuses on one part of the study; the extent to which faculty are responding to changes in the teaching environment due to discussion and integration of online learning, whether they are teaching online or not. Our current results report that significant change is underway, for those teaching in face-to-face environments and those teaching online.

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## **Faculty Role Change: Adjustment to the Influence of Online Teaching and Learning**

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## **SUCCESSFUL ONLINE DISTANCE LEARNERS: AN EXPLORATION OF LEARNER CHARACTERISTICS AND PATTERNS IN ONLINE LEARNING**

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### **Abstract**

The rapid growth in online learning over the last two decades has led to a considerable focus on researching a range of issues that impact on the online distance learner experience. These investigations have focussed primarily on instructional or learning design, interaction and communication in learning communities and learner characteristics. Online distance learning research which has had a focus on learner characteristics has been essential over the past two decades for understanding how to support diverse learners within this mode especially given ongoing high attrition rates. While much focus has been on the types of interventions that organisations might deploy, it remains that learners cannot be easily classified into homogenous groups and there is a need to understand more deeply who they are and how they behave as individual online distance learners. With this in mind, the focus of the research reported here was ‘how do mature-age distance learners go about learning?’ by providing insight into the lived experience of individual learners. The study focused on developing an understanding of the kinds of student-centred learning experiences that support students to be successful online distance learners.

The paper situates the research in the macro, meso, micro theoretical framework for researching online distance learning and focuses this study at the micro-level. The paper explores learner characteristics in relation to learner behaviour patterns and discusses the general findings of the project in relation to learner characteristics. The paper also provides two case studies that demonstrate the patterns that some distance learners have developed or adopted to support successful outcomes in online distance learning. The paper outlines the methodology used to uncover these patterns and learner characteristics and the importance of these patterns to support successful participation in online distance learning and concludes with some suggestions for further research.

## Introduction

Research into online distance learning has contributed considerable understanding of a learning mode that has grown in popularity over the last two decades (Zawacki-Richter & Anderson, 2014; Allen & Seaman 2014). While this work has undoubtedly contributed to improvements in online learner's experiences, online distance learning continues to be plagued by problems such as high attrition rates (Woodley & Simpson, 2014; Hart, 2012), concerns about quality (Harvey & Green, 1993; Ehlers, 2012), poor understanding of how to teach effectively online (Maybery et al., 2009), and the role of technology in online learning (Andrews & Tynan, 2012) amongst many other issues.

## Researching online distance learning

These continuing concerns, as outlined above, highlight the importance of the need for ongoing research into online distance learning but equally importantly, identify the requirement to develop understanding within a framework that provides a more holistic view of the field, its truths and issues. Zawacki-Richter and Anderson (2014) have suggested that:

*...research questions must be posed within a theoretical framework that is 'embedded within a holistic structure of research areas within a discipline. Furthermore, the structure, cultures, history and past accomplishments of a research discipline for the foundations for identifying gaps and priority areas for researchers (p.1).*

In their work Zawacki-Richter & Anderson identified three layers of research investigation in online distance education. These were identified as follows in Figure 1. Essentially at the macro-level the focus is on distance education systems and theories, at the meso-level the focus is on management, organisation and technology whereas at the micro level the focus is on teaching and learning issues and concerns.

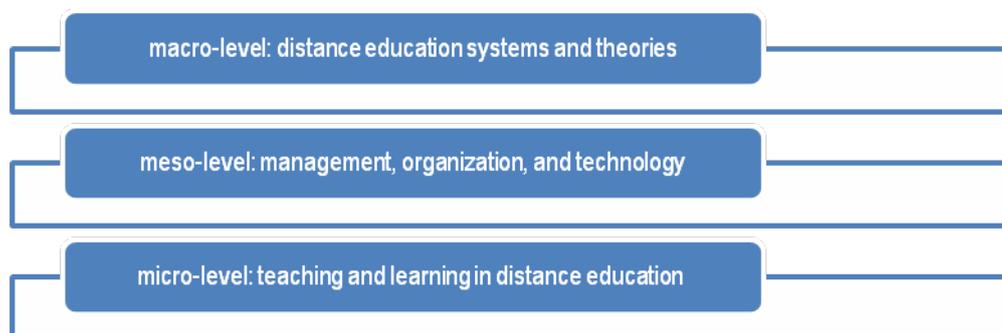


Figure 1. Characterisation of online distance learning research

Within these layers various topics are categorised as displayed in Table 1. The research reported in this paper has a focus at the micro level and specifically on learner characteristics and patterns of learning. In particular the study explored the lived experience of online distance

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learners, their aims and goals, their different approaches to learning, their dispositions and how they manage their learning.

Table 1: Examples of topics within the macro, meso and micro framework

<b>Macro -level</b>	<b>Meso-level</b>	<b>Micro level</b>
Access, equity and ethics	Management and organization	Instructional and or design issues
Globalisation of education and cross-cultural aspects	Costs and benefits	Interaction and communication in learning communities
Systems and institutional partnerships	Educational technology and infrastructure	Learner characteristics
Convergence of DE and blended	Innovation and change	
Theories and models	Professional development	
Research approaches, literature reviews and knowledge transfer	Learner support	
	Quality assurance	

## **Learner Characteristics**

Much has been written about the characteristics of learners in online and distance education. The focus has been largely on mature age and lifelong learners who have, since the 1950's, expanded in larger numbers as education has become more accessible. In an increasingly technologically mediated world distance learners are a changing demographic and the characteristics of these learners are also changing (Dabbagh, 2007). Moving away from the traditional notion of the distance learner as independent and place-based, Dabbagh suggests that digital literacy is an increasingly important characteristic for online distance learners. Successful online learners will need to know how to communicate and interact in a variety of online learning environments and without these abilities will struggle in contemporary online learning environments. Dabbagh also identifies other characteristics of successful online distance learners including:

- having a strong academic self-concept,
- possessing interpersonal and communication skills,
- understanding and valuing interaction and collaborative learning,
- possessing an internal locus of control,
- exhibiting self-directed learning skills.

Stoter, Bullen, Zawacki-Richter and Von Prummer (2014) identify a similar list to Dabbagh and include entry point, learners personality traits and dispositions for learning, their self-directedness, level of motivation, time (availability, flexibility, space) and the level of interaction between their teachers, the learning tools they have at their disposal and level of digital competency amongst many other characteristics. Hart (2012), adds to this picture characterising online learners who are successful in persisting in their studies as ones who

exhibit good time management and skills and have the ability to establish good relationships with other learners.

Notwithstanding these findings, it is important to recognize that part-time learners are not an homogenous group. While they may share an increasingly intertwined social, work and personal life within which learning is situated, they display behaviours that make each of them unique (Andrews & Tynan, 2012; Andrews, Tynan & James, 2011). Combined with the increasingly technological world in which learners live there are many influences on their individual goals and success factors when studying online distance education. The research however in these areas has been largely focussed on the traditional learner and while some work has been undertaken in the area of the online distance learner (Hart, 2012; Dabbagh, 2007) there remains a need for prioritising further work in the micro level of learner characteristics which draws upon the lived experience of individual learners in online distance learning modes. The field needs this research as online distance learning enrolments grow, attrition rates remain high (Allen & Seaman, 2010; Paterson & McFadden, 2009) and the world in which our learners learn is increasingly complex with many drivers impacting learner success.

## **Research approach**

The key objective of the project discussed here was to contribute to effective and positive learning experiences for the online learner in distance programs. Thus, the central research question of this study is ‘*how do mature-age distance learners go about learning?*’ This research questions fits well within the micro context for research into online distance learning (Zawacki-Richter & Anderson, 2014) and to identifying learner’s behaviours in relation to their learning activities. The project was funded by the Australian Government and the Office of Learning and Teaching (OLT) and involved four Australian universities – two research intensive traditional face-to-face institutions and two dual mode institutions offering both face-to-face and distance learning programs. The project also investigated the spaces and places (physical and virtual) within which distance learners participate in ICT supported teaching and learning activities.

The project took a “lived experience approach (Groenewald, 2004) and collected ‘student voice’ data, to illuminate understandings of distance learners’ experiences in relation to the ways in which they engage with ICTs, including mobile and social networking technologies. Within the phenomenological study frame, multiple methods were applied to collect data from students. Firstly, interested students were invited to join a Skype information session with a member of the study team. They completed a short demographic (9 question) survey form at that time, providing particulars of their study, work and domestic circumstances, and received a study pack in return. The pack contained the detailed study information sheet, method guidelines and a consent form for return to the project. Participants were invited to provide two types of diary data in various textual, audio, video and photographic formats, Charting the Weeks activities and the Day Experience Method, photos of learning spaces and

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to participate in a focus group discussion. In total 43 students from the 4 participating institutions completed the study.

### ***Charting the Week's Activities***

Charting the Week's Activities is a record of the amount of time participants spent, each day for a week they selected, on working, learning, personal, and social activities. Participants recorded the places they used for learning and the resources they utilised and could use video, audio or print diaries. This approach is well-suited to uncovering patterns in the ways in which online learners engage with their learning activities and resources.

### ***The Day Experience Method***

The Day Experience Method was developed for the Learning Landscape Project at Cambridge University (Riddle & Arnold, 2007) and adapted for this project. Participants provide a detailed record of their activities during an 18 hour period on a 'usual' study day. Irregularly timed SMS prompts are used to ask students to make a detailed record of their activity using either a video, audio or print diary immediately or as soon as possible after receiving the prompts.

Additionally, participants sent photos of their learning spaces and joined a focus group discussion conducted via Skype or, in some instances, teleconference. Focus group discussions were recorded for transcription. Email correspondence during the data collection period was also included in the dataset. The inquiry strategy provided a rich multi-media dataset from the perspective of the learner.

### ***Results and discussion***

The results of this study identified a number of learner characteristics and patterns of learning behaviours for the learners in this study. The participants in the study identified as successful online learners who are highly motivated individuals developing unique patterns of learning and self organization to support their learning activities and complete study requirements. A significant learner characteristics identified in the study was orchestrating time which is accomplished through managing self, using technology, learning on the go and participating in concurrent activities. While the theme of orchestrating time is consistent with the views of Stoter et al, (2014) and Hart (2012), that time management is an important characteristic for persisting in online distance learning programs, it goes beyond the concept of simple time management. Other characteristics related to connectedness, and technology use. An interesting theme that also emerged was the focus on wellbeing, the need for students to feel that they were happy and enjoying the different aspects of their lives. Notwithstanding the commonalities, students varied widely in the way they demonstrated these different characteristics, as found in a previous study by the authors (Andrews & Tynan, 2012; Andrews, Tynan & James, 2011).

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Finding ways to fit studies and learning activities in and around busy lives with multiple commitments was a major issue for 41 (95%) of the study participants. How participants managed their time for learning and other activities varied, highlighting the uniqueness of individual approaches, partly influenced by preferred learning style, partly course structure, but mainly by “...constantly juggling ... different jobs” as Rosemary (fictitious name) indicated in our study.

Managing self, learning on the go and concurrent strategies were integral to orchestrating time. Being able to manage themselves and their time was remarked on by two-thirds of participants. Strategies to manage learning, and especially to fit learning around other activities, varied from structured planning, relying on routine, to preparing for opportunities during the day or some mix of these.

Table 2: Christine (Wednesday)

<b>Times &amp; Duration</b>	<b>Type of task relating to learning</b>	<b>Technology used</b>	<b>Location</b>	<b>Comments on context</b>
<b>Wednesday</b>				
9.00am	Skim readings and lecture notes	Smartphone	shops	Having a milkshake while watching kids play
11.00 am	Check what other students are doing	Laptop, Facebook Skype	Lounge at home	Preparing for a collaborative quiz task
Midday – 4.00 pm	Talk with other students about quiz	Laptop, Skype	Lounge at home	'we all have kids so at times the numbers dropped to pick up kids from school, etc. 3pm had lunch while talking on Skype
7.00 pm	Helping others with quiz questions. Starting on assignment	Laptop, Facebook Skype	Lounge at home	
9.00 pm	Writing an assignment	Pdf & standard word processor	Lounge at home	Reference pdfs for assignment and reading these while doing assignment
11.00 pm – 11.30 pm	Complete online quiz	Laptop, Blackboard	Lounge at home	While taking a break (from assignment)
11.30 pm – midnight	Resumed assignment	Laptop, Pdf & standard word processor	Home	
Midnight – 2,00 am	Exchanging assignments via email	Laptop, Email, MSN	Home	At midnight talking to a student doing same assignment. Exchange assignments for editing. Realise they have tackled assignment in a different way – decide this is a good thing and insightful for both.

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As an example of the variability of individual students, two case studies, Christine and Zara (fictitious names) are discussed in relation to the learner characteristics identified in the study and the different patterns of learning behaviours that successful online distance students display.

As can be seen in Tables 2 & 3 both Christine and Zara are expert orchestrators of time, making use of opportunities as they arise and also planning time carefully while juggling different activities and responsibilities to manage their study. Table 2 demonstrates how Christine learns on the go and uses concurrent strategies as part of her learning behaviours.

Zara (Table 3) also makes use of learning on the go and concurrent strategies, but in very different ways. Technology is an important enabler for learners in managing their learning (Stoter, et al, 2014; Dabbagh, 2007). Learners vary greatly in the way they use technology again as demonstrated by the differences in Christine and Zara’s experiences. Mobile technologies are increasingly integral to learners orchestration of time and both Christine and Zara made use of these technologies not just to learn on the go but also to enable them to engage concurrently in learning and other activities.

Table 3: Zara (Tuesday and Wednesday)

<b>Times &amp; Duration</b>	<b>Type of Task relating to learning</b>	<b>Technology used</b>	<b>Location</b>	<b>Comments on Context</b>
<b>Tuesday</b>				
10.00 am – Midday	Deliver presentation + Study	Work laptop, no internet	Small town bowls club	Doing study u “downtime” from work activity
4.00 pm – 6.00 pm	Deliver presentation + Study	Work laptop, no internet	Small town bowls club	Doing study in downtime from work activity
9.00 pm	Check email		Motel room	This may be work related
<b>Wednesday</b>				
5.00am – 7.00 am	Study	Work laptop, hotel internet, Mobile personal iPhone	Hotel room	Details of study not provided. iPhone is personal tool
4.00 pm – 6.00 pm	Study	Work laptop, hotel internet, personal iPhone	Hotel room	Details of study not provided

Connectedness was identified as a key characteristic of the learners in this study and moves away from the concept of independent distance learner that was typical of more traditional distance learning prior to the widespread adoption on online distance learning. In this project connectedness was understood as distance learners’ ability to interact and engage with the people and other learning resources that frame their learning spaces. The theme built on coding for the people that students’ viewed as important to their learning experience, feelings (of inclusion or isolation) as well as the personal choices and strategies that made things work

for them. For Christine connectedness was achieved by using a range of social media and online communication tools to interact with other learners (Table 2). For Zara, this was demonstrated through connecting with resources when internet access enabled her to do so.

A somewhat surprising characteristic that emerged from the study was that of wellbeing. Wellbeing identified as an important driver for many of the choices students make, not only about when but also about where and how they engage in their learning. Student wellbeing is defined here as a sustainable state of positive mood and attitude, resilience, and satisfaction with self, relationships and learning experiences. In Christine's case (Table 2) spending time watching her children play while she also did some study contributed to this sense of wellbeing. For Zara this was accomplished through concurrent work and learning activities (Table 3).

## **Conclusion**

This study, which focused on the 'lived experience' of learners provided deep insights into learner characteristics and patterns in learning behaviours and the ways in which individuals applied these to their particular circumstances in order to be successful online learners. Understanding the complexity of the different ways in which the students such as Christine and Zara manage their learning is important for supporting their progress. University administrators, instructional designers and their teachers for example can learn about how best to create learning experiences that can take into account how learners orchestrate their time so as to support them in managing their learning. Recognizing the ways in which they use technology for learning on the go, balance concurrent activities and connectedness, while aiming for a sense of wellbeing also highlights the need for ongoing research of online distance learners' behaviours.

As the online distance learning environment continues to evolve with the ongoing and widespread adoption of technology, learner behaviours and characteristics will also change and evolve, requiring ongoing research to ensure that our understanding of learners keeps pace with these changes and universities can provide the kinds of learning experience that contribute to successful online learning and potentially minimising attrition.

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## **INDIVIDUAL LEARNING PATH IN GAMIFIED ENVIRONMENT**

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### **Summary**

The purpose of the paper is to present the preliminary findings of a research project aimed at individualization in Technology Enhanced Learning. In the first section we are going to present a brief context of the research explaining what are the differences between personalization, individualization and differentiation and what is meant by the individualized approach in our research. Also some other research works related to the scope of the project will be indicated. In the second section the concept of a project and its main phases will be described, followed by the presentation of the current stage of work. Further works, both with regard to the nearest future and to a longer period of time will be introduced briefly. The paper will finish with some conclusions and observations concerning the results already achieved and the steps completed up to now.

### **Introduction**

Although information and communication technology (ICT) is commonly used in education for a couple of decades there is still a lot of discussion about the way it should be used in order to improve the teaching and learning results. One of the frequently raised issues is the usefulness of ICT for personalizing learners' experience. A number of different approaches can be observed during the recent years but they could be divided into two main categories. The solutions developed by those who believe technology can "replace" the teacher and play a role of an intelligent tutor. The main stream of that approach is be represented by AHS (Adaptive Hypermedia Systems) or Intelligent Tutorial Systems. Such systems are frequently associated with the research of Peter Brusilovsky, professor from the University of Pittsburgh and a chair of the School of Information Science, whose works appeared first in mid-nineties of the previous century. Brusilovsky's (1996) solutions are based on the use of Artificial Intelligence methods and techniques and represent the technical approach to personalization. Along with the increased presence of multimedia and mobile technologies in education another trend in personalization appeared, which can be generally described as the freedom for adapting the application interface and changing the settings in a way that it suits the learner best. But again, this is only technology and although personalized desktop or interface can establish more friendly or intuitive environment it does not change the way one learns and acquires new skills. In recent years the concept of big data and learning analytics are frequently used in the context of personalization. Big "educational players" like Pearson

Education<sup>1</sup> or Khan Academy claim they provide personalized learning based on the analysis of huge amounts of data describing the way how learners work and solve the problems they are given while learning. Such different interpretations of a word “personalization” have led to the attempts of distinguishing among various types of usage of that term and in consequence two other words are being used in parallel: individualization and differentiation. Barbara Bray and Kathleen McClaskey known from their research on personalized learning (2011-2014) elaborated a chart<sup>2</sup> which role is *to clarify the differences in these terms*. They define personalization as a process that learner-centred while differentiation and individualization are teacher-centred. In personalized learning *the learner is driving their learning and actively participates in the design of their learning*, while in differentiation *the teacher adjusts learning needs for groups of learners and designs instruction based on the learning needs of different groups of learners*. The teacher also plays a key role in individualization where (s)he *accommodates learning needs for the individual learner and customizes instruction based on the learning needs of the individual learner*. According to this classification the research project described in the following sections is aimed at individualization of learning, with some prospects of being extended to more personalized learning in the future, what will be discussed as the possible direction of future works. The model of individualized online course, which could be created by the use of the tools described in this paper has two other features that distinguish it from the other similar solutions:

1. Some elements of gamification are applied;
2. The course design includes activities which are aimed at developing soft competences like: leadership, collaboration skills, organizational skills, time management and others.

It is worth to be stressed that both aspects correspond well with contemporary trends in education, which include supporting the learners in acquiring the skills that are highly valued on the labour market and preparing them for lifelong learning (and the main area where gamification is being used are corporate trainings).

## **Project aims and scope**

The main objective of the project is to elaborate the methodology of designing the individualized courses and of implementing them into online and blended learning. The project has been financed by The Polish-Norwegian Research Fund within the scope of so called Small Grant Scheme aimed at women doing research in technical sciences<sup>3</sup>. Although originally the scope of the project was placed in computer science there is no doubt that pedagogical aspects of the issue are equally important. The pedagogical and technological aspects influence each other, which means that the conceptual work and software solutions

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<sup>1</sup> The adaptive learning platform built by Pearson is called Knewton – detail available at: <http://www.knewton.com/> [retrieved 2.09.2014]

<sup>2</sup> The recent version of the chart can be viewed on the website: <http://www.personalizelearning.com/2013/03/new-personalization-vs-differentiation.html> or on the Slideshare at: <http://www.slideshare.net/barbarabray1/pdi-v3-2> [retrieved 30.08.2014]

<sup>3</sup> INDIPATH, Formal description of individual learning path in Technology Enhanced Learning, project ref. No Pol-Nor/205110/12/2013

## **Individual Learning Path in Gamified Environment**

*Maria Zajac, Marcin Piekarczyk*

are well settled in teaching practice which is not often the case when talking about adaptive learning systems. Therefore the necessary steps of the project could be outlined as follows:

1. To establish the context for individualization – how is it understood and realized in practice;
2. To identify as many as possible different forms of engaging the learners and increasing their motivation for learning (this was done by analysing good practices both accessible as online courses and described in the literature);
3. To elaborate a system of identifying different types of course components and activities with the aim of assigning diversified activities to the different learners' profiles they correspond with;
4. To prepare a sample individualized course and to implement it in a chosen learning environment;
5. To run a course, evaluate its workflow and improve the system based on evaluation results.

The project started in September 2013 and now it is at the step 4, that will be implemented in the autumn semester 2014/2015.

At the beginning it was planned that the project will end with the definition of a dedicated language (based on XML) that would allow the authors of the courses enhanced by the use of technology to design their structure and their content with focus on individualized approach to the learners needs and preferences. At the current stage (almost a halfway of the whole project) we are convinced that the language itself is not enough and that elaboration of the necessary tools that create an environment for individualization is necessary. Some of them will hopefully be ready at the end of the project whereas some others are suggested as the future works.

### ***The overall concept of the system***

As far as the technological aspect of the project is concerned the main challenge is to create an algorithm that would be able to adjust the course content to the learners' individual needs. This should be understood that the author of the course that is intended to be delivered in an individualized manner creates its content, which is redundant in some way because it includes various types of tasks corresponding with different learners' profiles. Some course components (incl.: general instructions, course completion requirements, game rules, some units of learning content and even some activities) are common for the whole cohort of learners whereas the others are aimed at particular working teams or individual learners, depending on their preferences and the role they play in a group (and consequently in a whole course). Those preferences are recognized by the appropriate tests, which will be introduced in the following section. In brief – two types of tests are used – the results of the Bartle's test show the individual preferences in a gamified context, while Learning Styles Inventory gives the indications for audio-visual form of learning content contrasted with the verbal (descriptive and explanatory) or graphical (logically structured and concise) form. The first

part of those data helps the teacher to match the learners with the roles they will play in a course and to create the working groups of them. The heart of the system is the *Selection engine*, which goal is to create individualized version of a course, which will be a subset of the original one. The general overview of the system is presented in Figure 1.

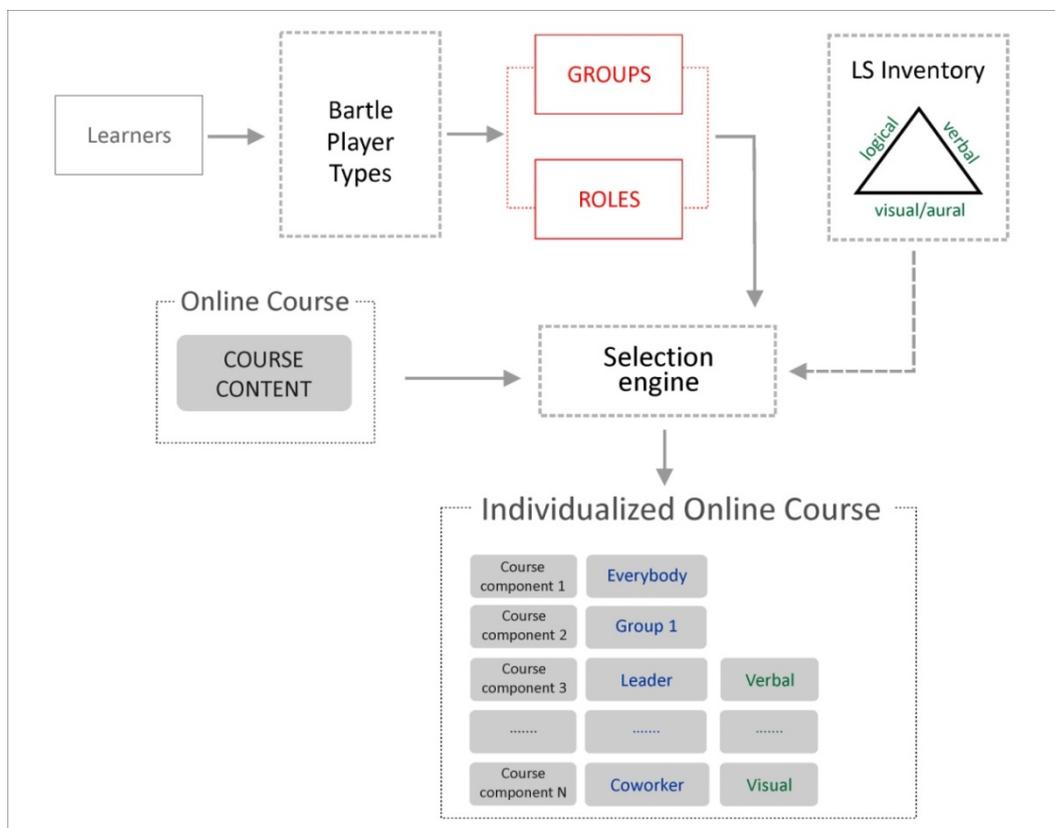


Figure 1. The structure of the individualization system

As far as the pedagogical aspect is concerned the main challenge refers to finding a solution to the problem expressed by the following question:

*How should we design the learners' activities in a course that will support achieving the same learning objectives in different ways, depending on the learners' profile or preferences?*

The answer to this question can be given only by a human being, namely a teacher. That is why a heuristic approach has been undertaken in the project – two experimental online courses are being created for two university subjects to be realized in the autumn semester 2014/2015 (October 2014 till the end of January 2015). The characteristics of learners' profiles applied in the experiment will constitute the base for creating versatile activities aimed at different types of learners. This combined with the vast experience of the authors in online teaching as well as the analysis of other good practices should result in creating the set of rules to be implemented later on in the selection engine.

### ***How to individualize learning experience***

The main issue in the first phase of the project was to define the backgrounds for identifying individual learners needs. Based on the previous research of the authors one of the possibilities taken into account was the concept of learning styles. Despite some controversy that learning styles cause among the researchers and educators the authors have positive experience in that area (Zajac, 2009). The questionnaire already used by them was collocated with Howard Gardner's Multiple Intelligence Theory<sup>4</sup> and it helped to recognize the extent to what a particular learner has developed each of the seven learning styles corresponding with seven main types of intelligence indicated by Gardner (1983). Four of them – visual, aural, verbal and logical – are addressed in the course directly by different forms of learning content as mentioned above and the other three – kinaesthetic, social and solitary – have to be reflected in adequate activities. Another source of data describing the learners' preferences was the Bartle test of player types (Gamer DNA, 1996). This test indicates four player types called: achiever, explorer, socialiser and killer. As individualization in the project is based on three pillars: gamification, project based learning and collaboration (teamwork) the Bartle's test results have been combined with the Belbin's theory of team roles (2012) and finally four different roles have been defined: leader, researcher, co-worker and player. The advantage of introducing those roles is not only better organization of teamwork but also creating the possibility of assigning dedicated individual tasks to the learners who play particular roles in the team and in the course. There are several possible ways of creating the teams according to identified roles, – starting from the very formal (based on indicated player types) to totally intuitive and heuristic based on the teacher experience and his/her knowledge about their learners, some of them were briefly described by Douglas Kiang in his blogpost (2014). Probably the most common 'algorithm' leads to creating the groups of four learners, in which every person plays a different role, but in some contexts establishing the groups identified by the role i.e. group of leaders, group of researchers will be more justified. Especially when we design the activities that are aimed at improving soft skills like for instance team management or critical thinking. Table 1 illustrates one of the possible divisions of 16 learners cohort into four teams. The algorithm used here was partly "statistical" and partly heuristic – this should be understood that all learners got access to the results of test (stored in a Google form) and they were allowed to create the teams of four on their own, but with the requirement that everyone should take on a different role and that role must correspond with the profiles indicated by the Bartle's test. The experiment took place in previous semester (February till June 2014) and the groups worked in partly gamified context but not in individualized manner (every group was given the same tasks) – it was a part of the pilot stage aimed at verifying the usefulness of Bartle's test for the arrangement of group work. Observation of their work has shown that the learners created the teams based on various types of informal relations among them, not really on the Bartle's test indications and that more strict rules

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<sup>4</sup> The original LSI, adapted by the authors to the Polish educational conditions is called Memletics Learning Styles Questionnaire and is available online at: <http://www.learning-styles-online.com/inventory/questions.php> [retrieved at 30.08.2014]

must be introduced in the future if the learner's roles are expected to influence their work and type of activity.

Table 1: Division into groups based on the Bartle's test results

No	name	Bartle's test results				KS-TIW results							team
		achiev.	expl.	ocialize	killer	VIS	AUR	VERB	LOG	PHYS	SOC	SOL	
1	Piotr	80%	53%	53%	80%	9	12	10	14	12	14	5	Z1
2	Mateusz	87%	75%	40%	73%	11	13	12	12	9	17	10	Z1
3	Jarek	60%	53%	27%	73%	10	8	9	18	7	12	12	Z1
4	Arek	33%	80%	40%	67%	15	12	10	14	16	12	9	Z1
5	Mateusz2	27%	60%	47%	67%	8	8	5	17	5	5	15	Z2
6	Maciej	53%	27%	67%	53%	9	9	9	11	12	11	11	Z2
7	Mateusz3	73%	67%	47%	13%	9	10	6	13	9	12	6	Z2
8	Jakub	0%	67%	60%	80%	7	13	5	8	11	14	7	Z2
9	Filip	47%	53%	13%	93%	9	12	14	11	10	13	14	Z3
11	Kamil	40%	47%	33%	67%	15	11	10	15	12	10	15	Z3
12	Mateusz4	73%	73%	40%	27%	9	10	6	12	12	11	13	Z3
14	Bartek	47%	73%	53%	27%	7	10	9	15	9	14	9	Z3
13	Przemek	53%	100%	60%	13%	9	11	9	15	7	10	14	Z4
14	Anita	60%	73%	87%	27%	10	11	6	18	6	10	15	Z4
15	Szymon	53%	47%	40%	60%	14	15	8	13	13	14	11	Z4
16	Tadeusz	27%	93%	60%	33%	11	16	15	18	9	13	10	Z4

## Implementation of the project

At the experimental phase all the tools and solutions i.e. grouping algorithm, selection engine are tested on the Moodle platform. The users data are stored in the Moodle files extended by additional tags and the algorithm that transforms that data and creates the groups is written in Python. The course structure including the indications for particular roles and groups must be written in EDL, which is a dedicated language based on XML syntax with its own structure stored in associated XML Schema file. It is planned that in the next step a dedicated EDL-editor will be implemented with the aim of supporting the design process of the individualized course.

## Future works

There are a couple of things that could be done in order to further develop the already described concept. One of them could be a move towards personalization of learning, which is step 2 in Bray and McClaskey chart. While step 1 (already achieved) represents *adjusting the learning process to what the teacher thinks will most suitable for a particular learner*, in step 2 the learner *has voice and choice* – which in this context means that the learner can decide which activities are more engaging for them and shape the course in collaboration with teacher. This could an interesting direction of further development.

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As it was already mentioned at the experimental stage the system is implemented on the Moodle platform therefore the other piece of work which should be done in the future is to consider its implementation also on the other learning platforms.

It would also be necessary to evaluate the effectiveness of teaching and learning processes based on individualised courses.

Another area of further works relates to the game rules and maybe game mechanics – what have been already done in this area within the scope of the project is only the beginning.

## Conclusions

One may ask what is the purpose of creating such concept of individualization if a lot of work still remains “in the hands” of the teacher. Two advantages can be indicated – first: the presented approach can be used for designing the online courses – once the course is designed using the EDL mechanism the only thing that the teacher must provide for a new group of students is the list of their results from the Bartle’s test and a KS-TIW (for Polish learners) or other equivalent MI based questionnaire. Dedicated algorithm will help then to create the working teams and rearrange the cohort into smaller groups (usually having 4 members) and the selection engine (SE) will generate for each learner an individualized version of a course. Secondly EDL can also be applied in blended learning not only because those parts of a course, which are delivered online could be individualized in the same way but also because the necessity to think off and to create diversified tasks and activities according to students profiles could stimulate the teacher to search for new didactic solutions and in consequence support achieving better learning outcomes.

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## **TEACHERS' PROFESSIONAL DEVELOPMENT THROUGH LEARNING ECOLOGIES: WHAT ARE THE EXPERTS VIEWS?**

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### **Introduction**

Professional profiles and the skills and knowledge that individuals need to thrive in today's society have been changing due to social changes generated in recent decades. We know that there is no single reason, but there is no doubt that the role of Information Technology and Communication (ICT) have been taking in all dimensions of our society is one of them. From this concept arises the influence of 'Net society'; a society whose social structure is based on a series of networks activated micro-electronically, with information and communication technologies, which are digitally processed and basically organized via the Internet Castells (2000, 2001, 2009). In a similar direction, Berners-Lee (2008) introduced the concept of 'social collaboration' where the Internet is perceived as something more than a tool for the transmission of data and documents. "The Web is humanity connected via technology", enabling people to receive, give and construct together in order to fulfil their individual and collective needs.

The scenario described above promotes the expansion of social networks on the Internet within the framework of Web 2.0 as a part of this phenomenon. Cross (2010); Downes (2007) and Siemens (2004) have described the benefits of informal learning, based on the connectivism theory. The possibility of creating networks of contacts and communities, being able to access content and information not physically available to us and to partake in experiences being developed by professionals in far-off distant contexts has meant that individuals can now become a communication node, which simultaneously gives and receives. These authors place great emphasis on the potentialities and benefits, which these learning communities can provide for professional development.

Within this setting, where ICT have an undisputed dominance, there emerge complex sets of contexts, comprised of activities, resources, and relationships, which provide new opportunities for learning in both physical and virtual spaces, and new opportunities for non-formal and formal learning. These sets of contexts are referred to as ecologies of learning, and

in this study, -Project ECO4LEARN<sup>1</sup> -, we focus on how these ecologies determine the professional profile of teachers in compulsory education, and how they can contribute to personalize training needs and increase the effectiveness of their professional development.

With this in mind, and with the aim of focusing our research on one particular group of professionals, we set out to provide answers to the following questions: What role do ecologies of lifelong learning play in teachers' training and professional development? What are the elements that make up teachers' lifelong and life wide learning ecologies? What role does each of the elements play and how do ICTs contribute? What benefits do teachers find in the various components that make up learning ecologies beyond those of traditional development schemes?

To answer these questions we have considered the use of ICT in education extends the potential learning space for professional development and updating of skills, thereby facilitating the concept of "life-long learning" (Delors, 1996) and supporting the policies of the European Commission (2005). But the potential benefits of ICTs go much further than just life-long learning, as they also promote both "life-wide learning" and "life-deep learning", concepts developed in studies (Banks et al., 2007) carried out at the LIFE Centre, USA. In addition to the time spent by each individual on his/her formal professional development, there is also the time spent on informal development via unplanned contacts and experiences ("life-wide"). Similarly, there is time dedicated to a more qualitative, deeper type of learning experience ("life-deep").

### ***Teacher's professional development needs in the Open World***

The professional development of teachers, at any stage of education, can be viewed as a unique opportunity for change and life long learning, beyond the conventional curriculum. It is seen as the 'best way' to guarantee the development of highly productive work environments (Carnoy, 2001).

According to Guitert and Area (2005, p.81) "rapid technological changes, the emergence of new cultural habits, increase in jobs related to the digitalization of information and the constant growth of scientific knowledge all create the need for a reconsideration and restructuring of the training models used hitherto". The European Commission (1996, p.22) states that "the crucial problem of employment in an economy which is constantly changing leads to the need for change in systems of education and professional training". Highlighting this point, Ferraté (2003), quoted by Guitert and Area (2005), emphasizes the fact that training, which overcomes the barriers of time and space, must be able to use and take advantage of ICTs in a correct manner and this can only be achieved via the necessary redesigning of the methodological content of training programs. This content must take into

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<sup>1</sup> Lifelong learning ecologies: contributions of ICT to teachers' professional development (ECO4LEARN). The Ministerio de Educación, Cultura y Deporte from Spain, supported this research. The aim of the project is to analyze and understand the ways in which learning ecologies contribute to the development and improvement of the professional activities of primary school teachers.

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account three basic tenets of educational change (UNESCO, 2008): basic knowledge of ICTs; a widening of knowledge and the creation of knowledge via the use of ICTs.

Authors such as Oblinger and Oblinger (2005), Palfrey and Gasser (2008), Prensky (2001), or Tapscott (2009) quoted by Sangrà et al. (2001) highlight the characteristics of the new generation of learners in our classrooms. While some authors argue that there has not been a generational change as such, but rather that changes have been determined by the context in which young people are growing up (Bullen et al., 2009; Bennet, Maton & Kervin, 2008; Jones & Cross, 2009; Kennedy et al., 2006; Romero et al., 2010; Selwyn, 2009), it is clear that teachers are aware that their skills need to be updated to deal with the new scenario they face.

The teacher nowadays also must evolve into a different role, becoming a facilitator of learning rather than someone who is transferring information, a content generator, promoter of the use of ICT, especially in social networks and Web 2.0 tools. With this vision of what the future teacher should be in the school environment, we have chosen to look at different cases in this investigation to which we have referred to as “champions” or pioneers of educational change.

### ***Lifelong learning ecologies***

The concept of ecology, developed by different authors such as Barron (2004, 2006), Brown (2000), Luckin (2010) or Uden, Wangsa and Damiani (2007) moves beyond Communities of Practice, Interest groups or Learning Communities and further even than social networks, given that these only exist as selected components of each individual's learning ecology. From this viewpoint, we understand the concept of learning ecology to be “a set of contexts made up of configurations of activities, materials, resources and relations generated in physical or virtual spaces, which provide opportunities for learning” (Barron, 2004, p.6). The conflict between physical or virtual, as they appear in this definition, has currently changed into juxtaposition.

We understand that learning ecologies are composed by different contexts and elements, with or without a technological base, that people use and manage for their professional development. These elements can range from institutionalized classroom courses to participation in specialized social networks through reading books or watching a television program. Each and every one of these elements is part of the learning ecology of an individual, who decides which ones to use, activating relationships with other people and environments that can bring and acquire new skills. This ecology as a set of elements, which go beyond a social network or community of practice, is undoubtedly mediated by technology; expand geometrically action, multiplying creating learning opportunities.

What is still unclear is whether learning ecologies, in the contemporary sense, with the scenarios described so far and influenced by ICT, can enhance formal learning systems that have been used so far. This is the reason why different questions arise in this context: Is the concept of learning ecologies a valid way to explain and increase levels of personalisation in life-long learning? How can each individual use his/her own learning ecology in order to

improve his/her professional activity? Which success factors or strategies need to be identified? What role does ICT play in the setting up of these ecologies?

## **Methodology**

With the general aim of this project, the research that we propose is part of a methodological paradigm that integrates two aspects: the interpretive perspective and socio-critical perspective. Thus, the aim we pursue is not only focused on describing and understanding learning ecologies along the lives of teachers, but also the transformation of both the practice and the socio-educative scenarios and the decision making that make this transformation possible (Sandin, 2003). In order to obtain a comprehensive view of the reality analysed, quantitative and qualitative methods were considered (Del Rincón et al., 1995) forming a mixed methodology (Hernandez et al., 2006; Hesse-Biber & Leavy, 2008).

The investigation procedure takes on 5 phases of development. In particular, to achieve the proposed goal, analysing and understanding the contributions of learning ecologies in the development and improvement of primary school teachers. We propose, first, to conceptualize learning ecologies for teacher education: understanding what they are and how they are configured, what are the main components and in particular those related to ICT. This first step of mainly theoretical, based on an exhaustive review of the literature, combined with the Delphi technique in which 10 national and international experts involved in the field of teacher training and educational use of ICT, allowed us to develop criteria for the selection of cases on teachers whose learning ecology for Training ICT is a key role.

In this paper we present, namely, the results obtained after the application of the Delphi technique, which allowed us to determine the criteria that have been taken into account in the selection of cases addressed in the next phase.

### ***Delphi technique***

As the aim of the project was to first conceptualize learning ecologies for teacher training, - understanding what they are and how they are configured, what are the main components and in particular those related to ICT, among others, it was decided to work in parallel and in combination with the literature review as well as the use of Delphi technique.

After exploring the concept of learning ecologies for the professional development of teachers, from the literature review, we proceeded with the Delphi technique and the extraction of the key elements that make mediated learning ecologies through ICT training.

Based on the theoretical bases identified, a qualitative exploration was carried through the Delphi technique, which is based on the principle of collective intelligence (Parisca, 1995). Furthermore, this is primarily employed “in cases where judgmental information is indispensable, and typically use a series of questionnaires interspersed with controlled opinion feedback” (Okoli & Pawlowski, 2004, p.16). This technique allowed us to explore the perceptions of experts in the field of teacher training and the use of ICT in education

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regarding the key elements in the learning ecologies of teachers. Experts were chosen based on their level of experience in the use of ICT in education, both from the point of view of teaching and research. We believe that this technique adapted to our initial target due to the emerging nature of the subject matter, targeting, therefore, the prospective analysis.

In terms of the number of participants required to a Delphi, this varies according to the research goals. Brockhoff (1975) carried out some tests comparing face-to-face and the dynamics of the Delphi communication and regarding group performance and expertise. He concluded that groups as small as four can perform satisfactorily. Regarding this recommendation, the process that followed was the completion of two rounds that consisted of 18 national and 3 international experts in these previously described areas.

The first round was aimed at, apart from some open questions, receiving information from these experts about their views regarding what ecologies contribute to professional teacher development and what components characterize these ecologies. From the analysis of the information obtained in the first phase and in order to obtain the highest degree of consensus among the experts, a questionnaire was designed to be completed by the same participants from the previous phase.

The questionnaire was divided into four blocks based on the questions raised in the first phase: How do today's primary school teachers develop themselves and stay updated? What specific components -resources, activities, face-to-face interactions or not, networks, etc.- help the professional development of primary school teachers? Which of these components promote a more efficient improvement of educational practice in terms of transfer? And, what are the benefits and drawbacks of each of these components in a teachers' professional development?

Each block contained a number of items from the responses taken from the previous round and were rated on a scale from 1 to 5 depending on the degree of overlap among expert responses as well as to the block to which they belonged (with elements as updated cited resources, the degree to which specific components were expressed by the experts in the previous round with regard to the professional development of teachers, the degree to which these components promote the improvement of educational practice and the benefits and disadvantages of the identified components that were expressed in the previous round). Subsequently, a descriptive statistical analysis of the questionnaire responses was conducted in order to validate the items identified in the first phase and sort them according to their ranking according to the experts (from highest to lowest), in which Mean and Mode values were used.

It is important to emphasize that the questionnaire aimed to validate the detected items and helped us organize and sort them according to relevance expressed by the experts themselves. Consider the results shown below.

## Results

With the general The results obtained after consulting the experts using the Delphi technique are presented in the following table which is organized into blocks that represent the most relevant sets and items that compose learning ecologies which additionally to provides a Mean and Mode index for each one of its components.

Block A:	Self-training	Formal training courses	Teacher Communities and Groups	
How do primary and secondary school teachers currently stay updated?	1.A Through content on the web (blogs and content generated by other teachers) (Mean: 3.5, Mode: 5) 2.A Through social networks (eg Twitter, Facebook or Tiching) (Mean: 3.28, Mode: 4) 3.PLE, books and magazines online and in print. (Mean: 2.8, Mode: 2)	1.Blended (Mean: 3,07, Mode: 4) 2.Face-to-face (Mean: 2.85, Mode: 4) 3.Online (Mean: 2,71, Modae: 4).	1.Investigation and innovation groups (related to one or more projects (Mean: 3,3, Mode: 4) 2.Exchange groups not necessarily related to a project (communities of practice or common interest, informal and or spontaneous working groups) (Mean: 3,2, Mode: 3). 3.Associations 4.Attending seminars or conferences (Mean: 2,6, Mode: 2 5FOUNDATIONS and institutions (Mean: 2,5, Mode: 2).	
Block B:	Face to face interaction:	Online interaction	Resources and digital and analog media	Training activities of different types
What specific components (resources, activities, or face to face interactions, networks, etc.) help the professional development of primary school teacher?	1.Peer interaction from an informal point of view (Mean: 3,9, Mode: 4) 2.Professional networks (e.g. Movimiento de renovaci3n pedag3gica de Catalunya, Asociaci3n Rosa Sensat, Asociaci3n Espiral (Mean: 3,6, Mode: 4) 3.Peer interaction from a formal point of view (Mean: 2,5, Mode: 3)	1.Educational networks based on teacher initiative (for example <i>Tiching</i> ) (Mean: 3,2, Mode: 4) 2.Educational networks (Promoted by regional governments, businesses, etc.. (e.g. XTEC) (Mean: 3,1, Mode: 3) 3.Social networks in general (Mean: 3,07, Mode: 3)	1.Portals and educational websites created by teachers, search engines and educational resource repositories (Mean: 3,3, Mode: 5) 2. Educational Blogs (Mean: 3, Mode: 4) 3.OER (Mean: 2,8, Mode: 3) 4 Magazines and specialized books on educational issues (print or digital) (Mean: 2,7, Mode: 3)  5.Online spaces created by the institution themselves. (Mean: 2,4, Mode: 3)	1.Courses and training at the institution where they are working (mean: 3,3, mode: 5) 2.Courses and activities with teachers from other schools or associations (Mean: 3,1 Mode: 5) 3.Courses and activities offered by the administration (recognized) (Mean: 3,1 Mode: 4) 4.Conference Courses, workshops and activities offered by higher education institutions (Mean: 2,7, Mode: 2) 5. MOOCs (Mean: 2,2, Mode: 2)
Block C	With regard to the training of teachers in the improvement of primary education, emphasis is placed on	Conditions that must happen for the transfer of teacher training in the classroom	Teacher learning communities	
Which of these components promote a more efficient improvement of educational practice in terms of transfer? Why?	1.Teacher training at their institutions arising from institutional strategy or recommendation by a directive team to solve specific issues situated in the actual context of teachers increasing their potential for transfer to the classroom. It may be in face-to-face or online. (Mean: 3,2, Mode: 5) 2.Individualized training, understood as a more personalized training and that be considered to become more efficient. It can also happen face-to-face or online. (Mean: 3,2, Mode: 3)	1.Understood as an organic process of adoption and not necessarily conscious: the intrinsic (internal or personal factors of the teacher, personal motivation) (Mean: 3,5, Mode: 5)  2. Extrinsic (external factors: employment context, the faculty group atmosphere, faculty) (Mean: 3,07, Mode: 3).	1.Teamwork with teachers from the same school or teachers from other schools that may happen in relation to a particular project or issue on a more timely basis, because it would associate the permanent learning communities. (Mean: 3,4, Mode: 5) 2. The creation of learning communities and spontaneous communities of practice voluntarily established where experiences are shared horizontally. Notably, the teachers involved in such interactions are often the most innovative and often maintain more or less stable communities. (Mean: 3,3, Mode: 3) 3. Personal interaction that from individual created teachers make up the community. (Mean: 3,14, Mode: 3)	
Block D	The most emphasized benefits based on order of importance identified by their ranking in the questionnaire	Identified drawbacks (based on the same ordering criteria of benefits)		
What are the benefits and drawbacks of the identified components in the professional development of teachers?	1.Ability to share experiences and information of interest (Mean: 3,9, Mode: 5) 2.Ability to identify with peers and learn about different proposals. (Mean: 3,7, Mode: 5) 3.Ability to access a large number of resources for implementation in practice. (Mean: 3,6, Mode: 5) 4.Promotion of an open teacher profile that is dynamic and critical to the educative system and the practice itself. (Mean: 3,5, Mode: 5) 5.Other courses of action in the classroom were suggested to them. (Mean: 3,57, Mode: 5) and the broadening of the educational skills of teachers. (Mean: 3,57, Mode: 5) 6.The promotion of reflection on educational practice. (Mean: 3,5, Mode: 5) 7.The promotion of permanent learning ( lifelong and wide life learning). (Mean: 3,5, Mode: 4) 8.The creation of communities of practice. (Mean: 3,3, Mode: 4) 9.Respect and consideration of the individual interests of each teacher in their individual training. (Mean: 3,2, Mode: 5) 10. Proliferation of new learning environments and spaces. (Mean: 3,28, Mode: 5) 11.Promotion of improvement training. (Mean: 3,21 Mode: 3) 12.Promotion of the movement of materials and closed resources (and often printed) to open resources. (Mean: 3,07 Mode: 4) 13.Response to a joint project for diagnosis and training centers. (Mean: 2,7, Mode: 2)	1.Not everyone responds with the same motivation and participation (Mean: 3,57, Mode: 5) 2.Sometimes, the permanent updating of teachers does not result in any transfer to educational practice in the classroom or towards any other end. (Mean: 3,2, Mode: 4) 3.Permanent changes in the teaching-learning practices without consolidating practice. (Mean: 3,2, Mode 3) 4.Said components are not useful for non-permeable innovation centres. (Mean: 3,07, Mode: 5) 5.Generation of feelings that resource selection results to be too time consuming as well as feelings of very rapid change and insecurity. (Mean: 2,8, Mode: 3) 6.Online activities are often perceived as individual activities and difficult in practical application. (Mean: 2,78, Mode: 3) 7. Teachers do not receive training in the proper use of resources and tools. (Mean: 2,71, Mode: 3)		

Figure 1. Results of the learning ecologies components

## Discussion and Conclusions

The first point we would like to highlight in the discussion of results is that this research becomes even more meaningful regarding the findings described below because the experts consulted are professionals who come from face-to-face models.

## Teachers' Professional Development through Learning Ecologies: What are the Experts Views?

*Marc Romero et al.*

In relation to how primary school teachers update themselves today, experts stress independent learning through access to blogs of other teachers producing similar content, social networking, reading books as well as printed and digital magazines. Additionally, the order established from the assessment of the questionnaires indicates that, according to experts, teachers are trained more efficiently from the content developed by other teachers that can be related to their daily practice, which consequently leads to more active participation and moves aside those levels established by other experts in the field. Furthermore, innovative actions in the school itself, community interaction, educational groups that aim to exchange concerns and best practices can be considered elements of valuable training for faculty experts. Finally, training courses, whether face-to-face, online or blended have been expressed to be something less valued which indicates that experts believe that the use of content generated by other teachers, conducting innovative actions in practice and the exchange of experiences are more valuable for teacher training and updating.

About what specific components mostly affect the teachers' professional development, we can conclude that are personal interaction that takes place with peer exchange and the dialogue established through participation in professional networking and educational networks, such as those promoted from the regional government, companies, or associations. Moreover, digital and analog media resources such as portals, blogs, websites, Open Educational Resources, among others, are considered very useful for updating their needs. And finally, highlights the different training types, such as conferences and seminars, courses and training activities offered by the centre where they are working, other activities offered by the administration or by higher education institutions or associations, as well as Massive Open Courses (MOOCs).

With regard to which of these components produces a noticeable improvement in educational practice in terms of transfer, great emphasis is placed on the faculty –virtual or in person- as a natural area in which teachers come together and share common concerns and projects. It is in the faculty where dialogue activities, the creation of communities and working groups, innovation, and the exchange of activities and training that are needed are promoted. Another component is based **on innovation activities in the centre based on the reflection**, arising from a permanent attitude of review and evaluation of practice that has a clear focus on improvement and innovation. In like manner, **distributed teaching resources through portals** can also be considered, since they can be used as examples for generating ideas that can be put into practice. The training of teachers both in the centre as the individual itself can also be highlighted.

Finally, regarding the advantages and disadvantages of the components that set the learning ecologies that influence the teachers' professional development, the experts participating in this research mostly identified the reflection of practice, peer contact, the opportunity to discuss common issues and questions, sharing resources and activities they already designed and used before, and the promotion of innovation, all as advantages. As major drawbacks, searching for resources is considered to be time consuming as well as the participation in

workshops that sometimes do not result into any improvement based on the inability for transfer, or the non-consolidation of some innovations or practices carried out due to constant change and little stability.

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## **TEACHERS PERCEPTION ON INNOVATIVE SERVICES AND ICT IN TEACHING AND LEARNING IN PRIMARY AND SECONDARY SCHOOLS IN CROATIA**

*Jasna Tingle, Dragana Kupres, Croatian Academic and Research Network – CARNet, Croatia*

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### **Abstract**

The focus of the paper is on researching and analysing teachers perception of using ICT in teaching and learning and for innovative services in primary and secondary schools in Croatia. The research was conducted in spring 2014 using qualitative methodology in small guided groups discussions, covering 10 schools, 26 focus groups and over 150 teachers of both primary and secondary schools in rural and urban, geographically dispersed locations of Croatia. The purpose of investigating the teachers perception was to inform the preparation of the large-scale national project of ICT in education called e-Schools, in which teachers should have the key role as change agents, and to engage teachers early in the project preparation. SCALE CCR model was used for data analysis. The results of the study show that most of the teachers still perceive ICT in education mainly as infrastructure, but are also very well aware of the advantages of using technology for learning, mainly for learning by exploring and meaningful activities.

### **Purpose of the study**

The main purpose of conducting the demand analysis study for using ICT in primary and secondary schools in Croatia was to prepare for future investments in large-scale implementation of ICT in Croatian primary and secondary schools. This large-scale implementation is planned under the umbrella of a national project called *e-Schools* that encompasses use of ICT in two directions: (i) for school administration purposes; (ii) for teaching and learning. The project is led by CARNet, with partners from major stakeholders in Croatian school education sector (Ministry of Science, Education and Sports, agencies for teacher training and vocational education, universities) and is to be implemented in phases between 2016-2022. The major goal of the project is to support Croatian public funded school to become digitally mature or digitally supportive schools by 2022, in accordance with Digital Agenda for Europe, and Republic of Croatia's Strategy on Education. E-Schools are digitally mature or digitally supportive schools, connected to ultra-fast Internet, highly equipped with adequate ICT, with a high level of digitalization of administration and education processes. Teachers attending these schools are digitally competent and pupils are taught and

encouraged to become digitally competent themselves. Both of them use ICT in education on daily basis, including, but not restricted to, education applications and digital education resources, thus ensuring that pupils of today become competitive workers on job markets of tomorrow. This should be done through the following:

- Education, empowerment and support for teachers and school administrators in the field of digital competences;
- Development of e-services for school administration, teaching and learning;
- Production of digital content and accompanying pedagogical methods;
- Deployment of local school networks (LANs).

In these processes, teachers are being recognized as change agents and key persons to carry out the change in education system toward student-centred, competency based education, that technology can facilitate. With the demand analysis study CARNet wants to research how teachers are perceiving the role of technology in their everyday work, to be able to: (i) better and more precisely plan the project; (ii) meaningfully engage teachers in preparation of the project and in that manner in the future project activities.

Several other research studies have been carried out or are planned (for example, survey for headmasters, school founders etc.), however, this paper focus is on teachers demand on the use of ICT in teaching and learning in Croatian schools.

## **Literature and CARNet experience**

CARNet experience shows that present state of using ICT in Croatian schools is on different levels of digital maturity, in various aspects:

- availability and speed of Internet in a school;
- level of ICT equipment in the school, including LANs;
- teachers' digital competency;
- support of the school management towards teachers to use ICT in education and to professionally;
- digitalization of administration processes.

School principals are more inclined towards recognising the importance of ICT in teaching and learning than teachers, and among teachers, those in primary schools are more inclined than the secondary school teachers. However, only 7% of schools created strategic documents for planning and defining use of ICT in teaching and learning (EU average 22%). From the perspective of pupils (last grade of primary school) the ICT is used for learning activities almost never, or couple of times per month, depending on the school (1.61 average on the scale from 1-4). On the other hand, 38% of primary school teachers say they use ICT in their work. (The hypothesis that teachers use it for their preparation, and not for learning activities, is being checked in the described demand analysis as well.) (European Schoolnet, University of Liège, 2013)

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The importance of the role of the teachers in managing change, both in administration and teaching and learning, facilitated by the use of ICT, has already been documented, stressing the importance of the bottom-up approach and contextualising ICT policies for teachers (Meyer & Kristensen, 2011), but also combining bottom-up with top-down approaches with specific activities that focus on awareness, education, implementation, promotion and support (Mudrinić Ribić & Quien, 2013).

Many large scale project introducing ICT in education worldwide, recognised the key role of the teachers as well, starting from 1:1 initiatives, or regional or national project of implementing ICT in education (Kampylis et al., 2013). Barrier framework for accepting and managing change have been proposed in related fields as well, such as knowledge management (Pirkkalainen & Pawlowski, 2012; 2013), and have been tested and used in the e-learning practice in projects such as Open Discovery Space (Open Discovery Space, 2014).

SCALE CCR multi-dimensional concept was chosen as an evaluation tool for the large-scale project planning, e-Schools. The same model was introduced for the purpose of data analysis of the focus groups and world café group as well as for the purpose of testing the model itself in the context of Croatian schools and project preparation in CARNet. (Bocconi, Kampylis, Punie, 2012a; 2012b).

### **Research questions**

If the starting point of the large-scale implementation of ICT in education processes in Croatian school system is the acknowledgement that teachers are the key carriers of the change, than it is vital to understand the teachers' point of view, in relation to advantages and barriers they see in managing that change. For that reason, the key questions for this part of the demand analysis were:

What advantages from using ICT in teaching and learning do teachers in Croatian primary and secondary schools perceive?

What are the barriers, and possible solutions to overcome them, in using ICT in teaching and learning that teachers perceive?

### **Methodology**

A decision was made in CARNet to use the focus group methodology for this research. In the opinion of the project team this qualitative research method would provide CARNet with the insight in the attitude of teachers in primary and secondary schools towards the implementation of ICT in teaching and learning. Conducting the focus groups was planned for the spring 2014, and the process of preparation also served a particular purpose. Project team selected 10 schools in which the focus groups were to be conducted, making sure that both primary and secondary schools would be represented and having in mind the size and the geographical location of the school (in addition to the differences between a school in the

village and the one in the city, in Croatia there are cultural differences among different regions). In two of the selected schools two separate focus groups were organised which resulted in the larger number of contributions than previously expected. Communication with schools during the focus group preparation was used as an opportunity to inform the school management about the project. Whenever possible a short presentation about the project was given to the school management and the focus group participants.

Focus group, as a form of a guided group discussion in which several related questions can be addressed, enabled CARNet team to ask questions such as:

- How, in your opinion, can ICT support your work as a teacher?
- What benefits/advantages from using ICT in teaching and learning do you see?
- What barriers for using ICT in your work do you see?
- In your opinion, what can be done to overcome the barriers you noticed?
- How do you understand the term “digital educational resources”? What kind of digital educational resources would you like to be available for your work as a teacher?
- How do you understand the term “ICT support”? What kind of support can you envisage?

During the focus group discussions groups were asked to summarize on paper their input on each issue, for which purpose they were given a template. For example, when they were asked about advantages and barriers of using ICT, they filled a two-column table with their lists of perceived advantages and barriers. Groups were advised to express themselves as freely as possible, in incomplete sentences if necessary (typical responses to the question about barriers were: “unreliable infrastructure”, “not every pupil has Internet access at home” etc.). These written responses were analysed by the researchers after completing the focus groups in all schools.

Due to the limited length, this paper focuses only on questions about advantages and barriers to ICT implementation. The results of the focus groups can be used in textual format that is sufficient to provide a deeper understanding of an issue in the sense of better explanation or multiple perspectives. However, they can also be quantified, which is what the researchers did in this case. For the analysis of the results, the authors used a SCALE CCR model described in literature. This circular model represents the European Commission’s Joint Research Centre JRC concept of Creative Classrooms i. e. learning environments in which ICT is used to innovate teaching and learning. The model places different aspects of ICT implementation in 8 categories and 28 subcategories (Bocconi, Kampylis, Punie, 2012a; 2012b). The 8 categories are: Content and Curricula, Assessment, Learning practices, Teaching practices, Organization, Leadership and Values, Connectedness and Infrastructure. These categories and the respective subcategories were used for coding the results of the focus groups. The number of responses in the same category were then calculated and presented graphically (see the Analysis of the results). Barriers, however, are only analysed as text.

## **Analysis of the results**

When asked about existing or possible advantages/benefits from using ICT in teaching and learning participants of the focus groups offered a variety of responses. The blue line on the radar-type graph below represents the number of responses that could be assigned to each category of the SCALE CCR model, which are here placed on the outer edge of the radar. The longest arm on the graph pointing towards the Learning practices means that participants of the focus groups thought that using ICT in schools has multiple benefits for the process of learning. They also saw some benefits for the process of organizing the education and many express great expectations and place a lot of trust in infrastructure. Some respondents noticed potential benefits for the content and curricula. In the same time, even though the respondents were teachers, they perceived fewer benefits from the ICT for the process of teaching. The areas of Assessment, Leadership and Values and Connectedness seem to have escaped the participants' attention entirely.

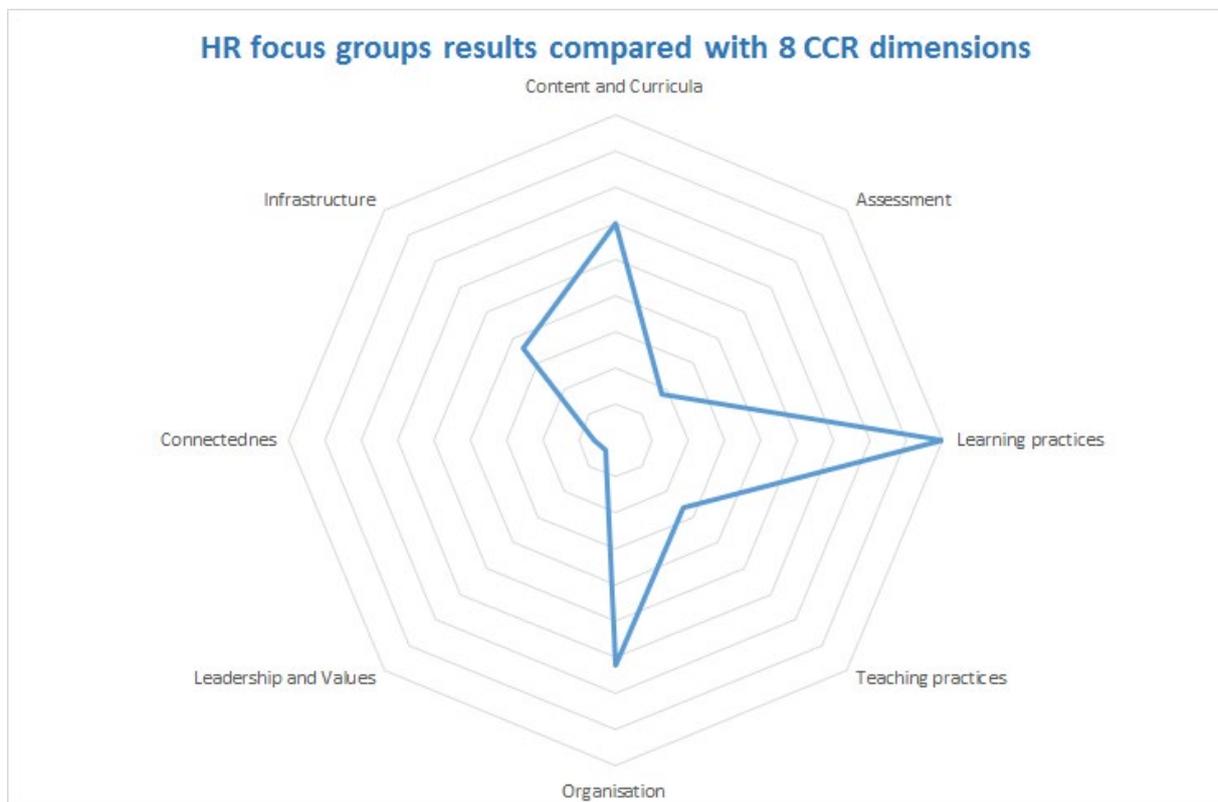


Figure 1. HR focus groups results compared with 8 CCR dimensions

For a more precise analysis the authors used a breakdown of 8 CCR categories into 28 “building blocks”, each of which represents one element of practice in creative classrooms (Table 1).

Table 1: Building blocks analysis

1. Emotional intelligence	13. cross and transdisciplinary	20. meaningful activities	22. OER	7. recognition of informal and non-formal learning	23. engaging assessment formats	24. formative assessment	14. learning by exploring	15. learning by creating	16. learning by playing	18. self regulated learning	19. personalised learning	21. pear-to-pear collaboration	2. Multiple mode of thinking	3. Individual strenghts	4. soft skills	17. multiple learning styles	8. monitoring quality	9. inovative timetables	11. inovative services	5. (Social) entrepreneurship	6. social inclusion and equity	27. information management	25. learning events	26. social networks	28. networking with real world	10. ICT infrastructure	12. physical space
Content and Curriculum	Assessment	Learning practices	Teaching practices	Organisation	Leadership and	Connectednes	Infrastructure																				

The results are shown on the radar graph in the figure below. The two graphs look quite different as the first one divides a perfect circle into 8 equal-size sections. This cannot be followed in the second graph as each of 8 dimensions consists of a different number of building blocks.

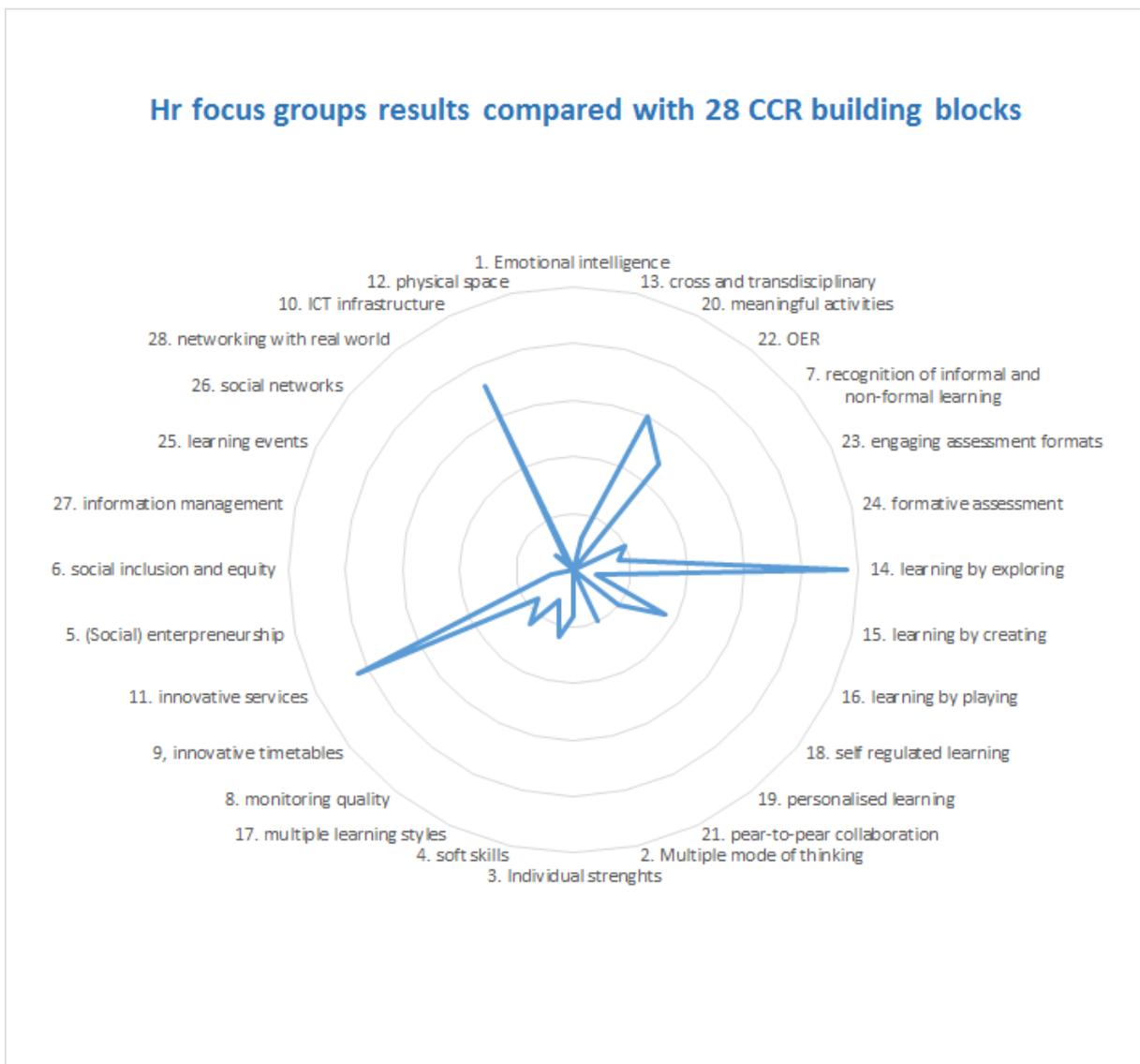


Figure 2. HR focus groups results compared with 28 CCR building blocks

However, on this figure it is much more evident that there are great differences in perception within each category. For example, while participants of the focus groups valued the benefits of ICT implementation for the dimension “content and curricula”, they actually mostly believe that ICT provides opportunity for meaningful activities and allows cross-disciplinary learning, while they do not think of it fostering emotional intelligence. Similarly, in the otherwise well represented category of Learning practices, only “learning by exploring” was emphasised by the participants, while they do not envisage the potentials of ICT for “learning by creating”. An even greater discrepancy is shown in the area of infrastructure. While participants emphasise the importance of the infrastructure, they have not started thinking yet that the same infrastructure could be used for overcoming obstacles in and making necessary changes in the physical space.

The question about barriers for ICT implementation also offered a variety of views. Many participants expressed disappointment with the basic infrastructure (lack of Internet access, old equipment, insufficient number of computers, need for permanent technical support...), while others noticed more subtle insufficiencies, such as need for continuous teacher training, additional time for teacher preparation, lack of digital teaching and learning materials in Croatian language and lack of computer applications in Croatian language. Participants also expressed their concern about the very large number of potential risks for pupils originating from either overly extensive or insufficiently prepared use of ICT in education (from ICT being supportive of copy-paste culture to health hazards). CARNet acknowledged the concerns but is more oriented to the solutions as participants were also required to propose some. Although some suggested solutions were not realistic as would require unavailable financial resources, some proposals are very innovative and are appreciated by CARNet. They include ideas about involving parents and other stake-holders into organisational changes required by use of ICT, balancing the use of ICT with more physical education and even changing the micro-schedule of school class to accommodate work with computers. All of these could be considered very innovative solutions for the Croatian context.

## **Conclusions**

The purpose of the research study described in the article was to dig deeper into the teachers’ perspective on using ICT for teaching and learning, especially with regard to barriers teachers perceive in implementing ICT and their overcoming. This is necessary in order to understand better the teachers position in relation to supporting and managing change in large-scale projects that introduce ICT in education. Another important reason for asking teachers the described questions early in the project preparation is to engage them in the meaningful way in the project planning, to re-shape the project structure according to study result with the main goal of supporting teachers later in the project implementation.

The results of the study have showed that more informed and more experienced the teachers, wider spectrum of ideas about using ICT and capability of noticing its advantages they have, together with higher expectations and variety of uses they show.

On a national level, it is evident that Croatian teachers still perceive ICT mostly as infrastructure (10), innovative services (11), however, they do perceive potentials and the need to use the technology for deeper learning, such as meaningful activities (20) and for learning by exploring (14). The results also show that teachers are not yet capable or have not yet endeavour in to using technology for social inclusion, social entrepreneurship, learning events, and that the changes technology use can have in the physical space are not thought about. These are the areas that CARNet can promote and should think of incorporating in the large-scale e-Schools project.

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## WHERE IS THE TEACHER IN ONLINE LEARNING: CENTRE STAGE OR CAMEO APPEARANCE?

*Julie Peschke, Athabasca University, Canada*

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At the conclusion of my first experience as a teacher in the cyberspace of no-bodies, I couldn't even prove that I had been there. I had no mementoes of the times my students and I had spent together over that prolonged seven-month period in the early part of 2010. I had no photographs of the group, no hard-copy textbook as a reference, no physical place to which to return for an encore. I had only memories. The recordings on file could, just as easily, have been taped in a studio ... and yet, it had not been an ethereal dream. Despite our mutual invisibility, one to the other, our presences had not gone unfelt. They had had their own reality – a virtual reality if you like – which had been transforming for all who had been there. The affect had been internalized into our psyches, both conscious and unconscious, and the legacy would, no doubt, impact our lives for many years to come.

Today I realize just how profound an impression that excursion into the virtual world of e-learning had had on me, as a teacher of mathematics, and as a person. It had altered my views of others' learning; it had changed my tenets of good pedagogy; and it had cut through some of my fore-conclusions about the use of technology in education.

### **The Online Educator**

So to where had I 'beamed' in this vast expanse of outer space which was not unlike some of the alien worlds of science fiction literature? Had I made my presence palpable? What roles had I played with those some twenty or so adult participants, all volunteers and all wanting to improve their mathematics skills in order to further their respective careers? Yes, I had been the architect, the creator. Yes, I had been the prime mover to get the project off the ground, so-to-speak. Without me, that encounter would never have taken place. However, in this new age classroom, I had not been able to command silence, participation, or even attentiveness. It was an environment devoid of confines and social norms. I had understood, however, that my active participation in this drama could not be *demand*ed or even expected. It would necessarily be *grant*ed. I had wondered how large or small a part I could actually play in their learning. At the outset of my research endeavour, these had been the great unknowns and I had had no preconceptions as to the answers.

The roles of online educators, formal or informal, can be as diverse as those of a teacher in a face-to-face classroom. I have always thought of teaching as a bit of theatre with interloping

vignettes of ‘*Whose line is it anyway?*’ in which a part of the pedagogical imperative was, at least, to command attention and engage in dialogue, if not to entertain. This can be difficult to achieve in a subject like mathematics but I was, more or less, convinced that it could be done – with enough effort, energy and innovation. Therefore, if we conceive of teaching as a kind of staged production with improvisational interludes, either live or on screen, then teachers in online settings can choose to take on any number of tasks, including:

- script-writers (authors of e-texts, software applications or static web site content),
- set designers and stage managers (responsible for web site design, navigation and construction),
- directors (those who take an active instructor’s / facilitator’s role in synchronous web conferencing or asynchronous web discussion forums),
- star performers (primary educators featured in a video series of taped lectures or interactive tutorials),
- actor understudies (those who explicate another’s e-text), and
- veteran experts who make cameo appearances for credibility, credit and impact – either in person or in iconographic imprint, even as Alfred Hitchcock had done in his television series.

No doubt, from earliest times, teachers have experimented with varying combinations of these roles to greater or lesser extent – often changing paradigms from one generation to another. At the beginning of the twenty-first century, we educators in this now ‘global village’ are facing another paradigm shift in how we *communicate* our collective understandings one to another. John Dewey (1916, p.12) had defined the educational process as follows:

*This education consists primarily in transmission through communication. Communication is a process of sharing experience till it becomes a common possession.*

What had been envisioned at that time as an in-person conversation between two or more open minded and curious individuals had now become exchanges over a wireless network in the form of packeted sequences of 0’s and 1’s between a group of participants residing in geographically–disparate locations around the planet.

It was in the context of this philosophical backdrop that I had begun, from 2008 onward, to think of extending my face-to-face teaching experience in mathematics into an online environment in which texts, dialogue and pedagogy were created and accomplished using the multimedia technologies then available. The primary question had been: Where would I position myself in this vast, fluid, auto-morphing space? I decided that the virtual stage was to be of my own making; I would be the script-writer, the set designer and the stage manager. It turned out that, at the outset of the online encounter, I was both director and star performer. However, as the participants’ understanding of the mathematics deepened, I gradually relinquished that centre stage and the students emerged as the star performers and assistant directors of that production. Nonetheless, in the kaleidoscope of hats I had donned during the enactment of that scripted venture, the critical role which led, at least according to my

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volunteer participants, to its pedagogical success had been my enduring presence, both asynchronously and synchronously, through its pages.

The journey had begun with an extensive, cross-disciplinary literature review of areas as diverse as adults learning mathematics, motivating factors for self-directed learners, the role of cognitive psychology in hypermedia environments, visuospatial considerations of web design and navigation, and case studies of other such experiments around the world on five continents of the globe.

### **Moving into the Pedagogy of No-bodies**

Already more than half a century ago, Marshall McLuhan (1962, pp.52-53), Canadian educator, philosopher and scholar, had daringly declared:

*The next medium, whatever it is—it may be the extension of consciousness—will include television as its content, not as its environment, and will transform television into an art form. A computer as a research and communication instrument could enhance retrieval, obsolesce mass library organization, retrieve the individual’s encyclopedic function and flip into a private line to speedily tailored data of a saleable kind.*

In my opinion, one is remiss to explore the phenomenon of online learning without some reference to Marshall McLuhan. His scholarly writings on communication media theory were prophetic and probing, particularly provocative and tantalizingly perplexing. His enigmatic aphorism, ‘The medium is the message’ (McLuhan, 1964, p.203), and his prediction of the World Wide Web (see the above quotation), almost twenty years before it was even invented, both compel us to examine his work concerning the influence of communication media – particularly as it relates to the effects of online pedagogy on both instructor and student in this digital age. Therefore, as I read his proclamation, I pondered the words carefully – ‘the extension of consciousness’ – and wondered what that would mean.

McLuhan (1962, 1964), in his work on the virtual properties of communication media, had already put forward his notion of a ‘*mosaic of language*’ to impart the deeper meanings of a text. I became convinced that these ideas, if played out in the realm of mathematical thought, had the potential to lead to a multi-dimensional understanding of the ideas which had led to our current understanding of the natural processes of the universe. Lamberti (2011) had also interpreted McLuhan’s mosaic as a tool to enhance our knowledge and our apprehension of writings and texts through the “interplay of ancient wisdom and cognitive stimulation” (Lamberti, 2011, p.xxxv). Further, she suggested that McLuhan’s mosaic was “born out of the meeting of orality and literacy” (p.xxxv) and played out by the juxtaposition and the connection of differences. In my understanding of it, this kind of mosaic was a path for a scholar to take towards what Gadamer (1989) had described as a “fusion of horizons” (p.245) whereby a scholar, when interpreting a text, finds a way to articulate the text’s history and meaning within his/her own background of understanding. In fact, McLuhan himself had

said: “**new media do not replace each other, they complicate each other**” (as cited by Lamberti, 2011, p.xli). Certainly, modern mathematics had been founded upon a broad base of historical sources dating back millenia and subsequently layered with the enlightenments of the generations to follow. With this in mind, I decided to interlace historical perspectives into the online manuscript of this project, including my own personal understandings, both mathematical and pedagogical. This was not going to be a ‘new’ approach to pedagogy. It was going to be a melding of past and present, a blend of text and voice, an unpacking of the language of explication through modern multimedia technologies – all intended, not only to elucidate but to encourage cognitive stimulation into innovative ways of viewing the age-old insights of past and present generations.

### ***Role as Script-Writer***

When I began my investigation into the creation of a fully online mathematics program, the prevailing pedagogical issues of such initiatives, in my opinion, had had to do with their form (the **how** of presentation) and their content (the **what** to include). In the ensuing years, the path to that end turned out to be long and circuitous, crossing a number of disciplinary divides but always circling back to the steady state of what had been successful in my past face-to-face encounters. It ultimately culminated in a multi-layered, blended model of both asynchronous and synchronous e-learning paradigms and a research study of student responses and learning experiences within it.

### *The Osmosis of the Subjective and the Objective: Personalizing Your Script*

In any educational endeavour, the subject matter and its messages to and through both instructor, as script-writer, and student, as participating reader or observer, permeate any learning environment with an ether of nuances. For example, how a teacher perceives the subject content will be tacitly communicated to her/his students in both overt and covert ways. My view of mathematics as a whole body of knowledge - a language, an art form and a philosophy of thinking – had always moulded and modified my teaching of its concepts. My personal perspectives of this academic discipline explicated, to some degree, my pedagogical approaches to the learning of its rigours and enigmas.

As abstract a subject as mathematics is generally perceived, I saw it as having many human faces. In my mind, it was a language with alphabet, grammar and composition whose vocabulary and syntax had to be learned over time in the same way that our natural languages are learned, from simple grammatical constructions to complex paragraphs of thought. I recognized its power as a coded form which scientists use to encapsulate the workings of our universe into relatively simple constructs called equations. In fact, rather than just a terse symbolic code to be accessed by only the initiated, I had begun to conceive of mathematical writings as poetic expressions, in the truest sense of the word. John Hollander (1961, p.7), in his book *The Untuning of the Sky*, had talked about poetry:

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*If a poem is to be treated as a highly complex utterance in a spoken language, its written form becomes a simple coding of it, word by word, onto a page.*

These aspects of mathematics as a descriptive language, a way of modelling our personal or collective activities, and a poetic utterance enabling us to understand the natural world around us encouraged me to believe that teaching mathematics online was indeed possible – even desirable. The duality of teaching and learning mathematical ideas can be seen as a kind of communication coming to a mutual understanding about an external object or process. Such communication, though sometimes through demonstration, is primarily through language, either spoken or written, or through art form (diagram or chart or video). Therefore, even though my students and I would be adrift in no-body's land, all of us still had our *virtual faces of language* to communicate the abstract ideas born of the personalized sensorial responses embedded in our inner selves.

### ***Role as Set Designer and Stage Manager***

Burbules (2006), some ninety years after Dewey (1916), addressed the notion of communication in a faceless world. He viewed an online environment as being a potential *space of collaboration* for those who engaged with it: “The fact that they inhabit a shared space is essential for this collaboration to work” (Burbules, 2006, p.44). Burbules's concept of ‘*immersion*’ (2006, p.40), through interest, involvement, imagination and interaction in and within such an environment, exhibited common threads with Dewey's process of sharing experience until it becomes a common possession. The online instructor, therefore, needs a *place of collaboration*, either self-constructed or ensconced within a pre-fabricated framework of course or learning managements systems.

I had chosen to build my own virtual classroom. It was a web site having an omnipresent drop-down navigational menu over an underlying graphical network of links laid out as a lattice with many avenues of entry and exit. Its contents consisted of a nested mosaic of media containing a hypermedia environment of my own audio-backed Flash tutorials, external videos and web sites of interest, historical notes, applications in science and other math-related disciplines, auto-marked exercises of practice, and an online discussion forum (See Peschke, 2008). As a virtual entity, I had hoped that it would become a stage on which mathematics could be showcased as a cross-cultural human endeavour and achievement. This web site became the back stage of personalized rehearsal and practice for both me and my research project participants. It was my unrehearsed script intended as an e-text for the students who came there to visit. Jeff Dutton, the IT expert who digitally set up the web site, and I were the stage designers and stage managers. Together, we answered all queries about the web site through ‘Help’ menu email links posted on the site itself.

### ***Role as Director and Performer***

A major issue, at the time, was: How can one share experiences if there is no togetherness of place? The web site was a place of individualized learning for pause and ponder with the

internal self but, as it turned out, not a platform of sharing and exchange despite the links to a discussion forum posted on the site. McLuhan had highlighted the issue another way: “**when you are on the phone or on the air you have no body**” (as cited by Lamberti, 2011, p.xxix). Both of these instances of technological communication take *place* in a kind of ethereal “zone of between,” to call on a phrase of Ted Aoki’s (2005, p.161). Even though persons involved exclusively in these kinds of media exchanges have no visual impact on each other, yet it is possible to develop, over a period of time with repeated interactions, a recognizable, personal identity or persona over both telephone and radio through one’s voice, through certain behaviours (such as if one laughs a lot or meanders in thought pattern) and through the medium of language expressed through that voice. Consider the experience of attending teleconference meetings or web conferences. Such technologies have simply altered the ratios of the senses from a mix of all five of the major senses, as in face-to-face situations, truncated to at most three of them, further trammelled by the hardware of the machines or devices being used. When you are communicating over the Internet (even with web cams), you also have no body which is tangible to the others. In particular, without web cams, you are truly **faceless**; you have been reduced to the greyed-in head and torso icon of certain email clients. Therefore I began to ask: What kind of personal identity and impact, if any, can anyone, in particular the instructor, have in such environments? How can ‘no- body’ become ‘somebody’ in a physical vacuum?

The solution was the inclusion of weekly synchronous web-conferenced tutorials. This virtual environment of imagery (white boards, markers, software applications, and text-based chat boxes) and sound (microphones and speakers) became our ‘live’ front stage on which the scripted parts and the extemporaneous interchanges would be played out. At the beginning of the project, I was the star performer and the director of action. Most of the participants came regularly and depended on my scripted e-texts, my explanations, my provocative leading questions and the provided homework as an impetus for their learning.

### *Metamorphosis into an Understudy*

As the participants who came regularly became more and more confident of their abilities and secure in their knowledge of the subject matter, I slowly allowed those who were eager and willing to occupy centre stage for a spot performance. Some came with questions only incidental to the core subject matter; others wanted to write on the whiteboard and explain their ideas in front of the group; and there were even those who asked to cover additional topics not on the curriculum. At those scene changes when actors and props re-arranged themselves into different configurations, I would fade into the backdrop of supporting props as each participant, in turn, stepped into the spot light as performer and director. I had become the understudy and would only intervene in the case of misconception or error.

## **Changing Rules of Engagement in a Virtual World**

I was now convinced that my virtual layered-media environment had indeed emulated the traditional face-to-face classroom experience. The evidence was there from the field texts and

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the analysis. Yet, technology aside, it had not been a traditional classroom. It had had a different flavour. This was a new era of pedagogy. Those who worked alongside me in this virtual experiment had not echoed the previously articulated concerns of some who had feared that the online social/cognitive experience would, de facto, be thin in comparison to that of physical face-to-face environments. True, in our classroom, there had been no eyes to read into the soul; there had been no body language to enrich the dialogue. Yet that hadn't seemed to make much difference to our social presences, nor to our collective learning. We had had lots of laughs, a bit of personal teasing and even a few schoolyard spats. More importantly, most of them achieved their goals and went on to succeed in their mathematical endeavours.

### ***Quintessential Pedagogy: A Dynamic Interlocution of Streams of Consciousness***

Anagnostopoulos, Basmadjian and McCrory (2005) had written an article about the de-centring of the teacher in virtual classrooms and its ramifications on the re-construction of social norms in such environments. In contrast to face-to-face settings where the ethos of social space and interaction was well-defined within the overriding cultural norms and expectations, Anagnostopoulos et al. (2005, pp.1699-1700) had suggested that online classrooms were still open to re-interpretation:

*Instead, teachers and students must deliberately consider how and when they will enter into the virtual classroom and where and how they will locate themselves and each other within it.*

Well, the twelve of us, who had stayed to the end of the project, had done just that. For example, in this virtual environment, there had been no Gutenberg text common to all learners. There had been no coercion to engage with any particular form of the available layered media texts. Each participant had quite simply 'done their own thing' with the spaces. Even I had experimented with media and pedagogy. We were children of a new age. Short, Williams, and Christie (1976) had defined social presence as "the degree of salience of another person in an interaction and the consequent salience of an interpersonal relationship" (as cited by Anagnostopoulos et al., 2005, p.1700). Certainly we collectively had experienced that salience one-on-one to a greater or a lesser extent. We each had defined our own level of engagement and interaction with the content and with the others. There were really no rules and certainly no expectations as to how and how much each participant should engage. I must admit that, before the project began, I had absolutely no idea what to expect in this developmental mathematics 'classroom' experiment. I simply moved with the moment and hoped that I could achieve my goal and my promise to those who came. 'Success' was not a word I could even define in this context because I had had no intention of examining them formally. I had simply followed my personal beliefs that learning and community were encapsulated by continuous communication through language and the regular habituation of a gathering place.

## The Centrality of Language and Place: The Heart Beat of Learning and Community

The answer as to whether my pedagogy changed in response to the virtual environment is two-fold: no, not in essence but, yes, in presentation. Working in a web conferencing, synchronous environment really didn't change my underlying philosophy or approach to the pedagogy of mathematics which I had previously used in face-to-face classrooms. The virtual face of language remained much the same as it had been before but customized, as had always been the case, to the students at hand with whom I was about to engage. The difference had had to do with the additional media I could draw upon to illustrate and explicate certain of the ideas, thereby affording a much richer presentation with more texture and colour. Whether the change from a physical to a virtual setting had changed the teaching/learning dynamics significantly was to be determined by the participants themselves. From the set of responses to all of the research questions, I concluded that this virtual experience had not been significantly different from those I or they had had in previously attended face-to-face university classrooms – with **two notable exceptions** – the teacher-student continuum of pedagogical control during the project, moving back and forth like a gentle pendulum swing, and the teacher-student continuance of social connection for months and even years after the project had ended.

What, for me, was a rather surprising outcome in the research project was the extent to which so many of the participants engaged in their learning and went on to pursue their dreams. Perhaps that contains one of the secrets of good pedagogy and teacher role-remodelling in mathematics settings – both online and offline. Shower them with attention, in one way or another, and definitely provide an array of asynchronous or synchronous options but allow each student to be free to choose his or her individual path of learning. In other words, loosen the rules of engagement. The free-form, information-rich, setting of the Internet affords an infinity of avenues for students to pursue their learning goals. With some guidance from a mentor, such explorations can greatly enhance the students' educational experiences and free them from the emotional straight-jackets of the past – in particular the affective trammels of a negative self-image, lack of confidence in one's ability and the sense of having no control.

I am of the opinion that the emerging role of the teacher in online settings can be instantiated through a moving continuum of theatrical production guises as diverse as: script-writer, set designer, stage manager; director, star-performer, understudy or even a cameo appearance. In essence, the teacher should be an omnipresent stream of consciousness – providing that continuous uninterrupted flow of thoughts and feelings through the mind – traversing any communication medium which is an “extension of consciousness” (McLuhan, 1962, p.52). Each teacher can make a choice as to which roles he/she will undertake personally but it is imperative that the teacher ensure that **all** roles be accounted for, by various and sundry, so that the resulting production is engaging, meaningful and pedagogically sound.

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## **UNDERSTANDING THE STUDENT EXPERIENCE: DOING THINGS BETTER IN STUDYING FIRST-TIME DISTANCE LEARNERS**

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### **Introduction**

Online learning has enabled many institutions to explore ways of widening access to educational offerings to a group of diverse and geographically dispersed learners. It is calculated that in the United States, 34% of all higher education students now take at least one course online (Allen & Seaman, 2014). Furthermore, Massive Open Online Courses (MOOCs) have quickly helped online learning to become a popular mainstream activity. However, the exponential growth of online students is juxtaposed with the retention and completion problems that have plagued distance learning ever since the first correspondence courses in the 19<sup>th</sup> Century (Dede cited in Waldrop, 2013).

There is growing concern internationally about enhancing student success as the return on the public investment in higher education comes under greater scrutiny. In New Zealand, for example, a recent Ministry of Education (2014) report on the higher education sector claims that distance delivered courses with an e-learning component have far lower completion rates than other delivery modes (see Figure 1). Although this study raises a number of unanswered methodological questions about how the data were gathered and interpreted, Figure 2 taken from the report compares completion rates for New Zealand's largest distance education provider, Massey University, with the Open University in the United Kingdom. Notably, the rates are much higher for Massey although in many respects this is an unfair comparison.

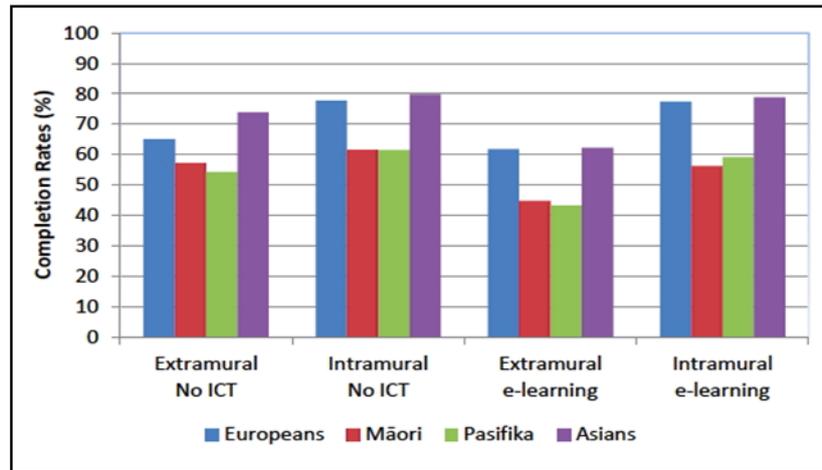


Figure 1. Internural and extramural completion rates and e-learning delivery

Massey University is a dual mode provider – that is, it offers distance education along with internal courses on three campuses throughout New Zealand. In contrast the Open University only offers courses by distance and is a truly open university. Nevertheless, an earlier study on the problem of retention found that at the Open University only 22% of undergraduate distance students completed their study within eight academic years (HEFCE, 2009). Thus, regardless of the methodological trustworthiness of either study, current concerns over retention and completion rates for distance learners are justified and clearly institutions need to do more to support student success. That said, we know from the literature that the study of retention is particularly complex and there are no magic bullets (Tinto, 2006-2007).

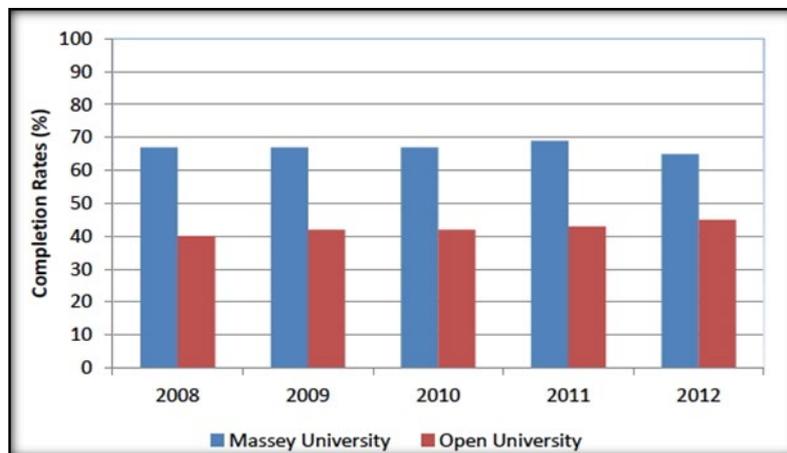


Figure 2. Comparison of part-time undergraduate completion rates with UK Open University

Simpson (2004) cautions against a ‘goulash’ approach during which institutions try lots of interventions that might work but, meanwhile, fail to focus on the most important things and cannot ever discover what is working best. Moreover, the problem of enhancing retention is often framed around promoting student engagement from an institutional definition rather than from a student perspective. In this respect the concept of engagement has many different faces and in the context of new digitally mediated forms of distance education we need to better understand what it means to be an active and engaged online learner.

Typically distance students who choose to study off-campus have very different backgrounds from campus-based students (Poskitt et al., 2011). In the developed world, generally speaking, the background demographics of distance learners indicate they are more likely to be over the age of 25, women or from a lower socio-economic group, returning to study after a break, and/or working part-time or full-time. While we know quite a lot about the background of distance learners, there is a significant gap in the literature in understanding the experiences of these students from their own perspective. Seeking to address this gap, the research reported in this paper sought to explore the 'lived experiences' of first-time online/distance learners in their own words over their first semester of study. In so doing the research raises a number of methodological issues that are outlined in the sections below.

## **Selecting the sample**

This first challenge in studying a group of first-time distance learners is identifying a sample of prospective students before they have formally registered. This is not an easy task. Nevertheless, the importance of doing so is that we have growing appreciation of how the decisions prospective students make in the initial period of the study lifecycle can significantly influence their chances of success. In our case to obtain a sample of first-time distance learners we had to rely upon access to institutional data from people who had formally expressed their intent to enrol. For ethical and internal institutional reasons it was not possible to source the sample through an independent communication channel, although such an approach may have been more successful in locating people much earlier in the study lifecycle. This remains an interesting methodological challenge in designing this type of study and potentially biases the sample by excluding people who discontinue before completion of the formal registration process.

Prior to the start of Semester 2 in 2011, with approval from the University's Human Ethics Committee, enrolment data was obtained for 750 students studying via distance for the first time. The method of recruitment was by email from the Project Leader to all potential participants at the point when their registration had been approved. The invitation included a Participant Information Sheet, which fully explained why students might consider recording video diaries for the purpose of research.

In total, 144 students volunteered to participate. This was a larger sample than anticipated and to acknowledge the high level of interest in participating in the study, and to add another valuable dimension to the research, these students were invited to complete an online questionnaire on their initial experiences of being a distance learner. Based on the survey responses, coupled with demographic data, 20 students were purposefully selected to participate in the main study (see Table 1). In selecting this sample the intention was to broadly represent the diversity of first-time distance learners. The profile of diversity was informed by a demographic analysis of the University's distance students during the 2010 academic year. Selection criteria included: age, gender, ethnicity, geographic location, subject

of study, level of study, entry qualification, along with prior or current experience of tertiary study on-campus.

Table 1: Summary of participant sample

<b>Gender</b>	Male (7), Female (13)
<b>Age</b>	Under 25 (4), 25-29 (4), 30-39 (6), 40-49 (4), 50-59 (2)
<b>Ethnicity</b>	Pakeha / European (12), Māori and/or Pasifika (8)
<b>Location</b>	A campus town (11), Other urban town (3), Remote (4), Overseas (2)
<b>Mode</b>	Distance only (17), Mixed mode (3)
<b>Total papers</b>	Undergraduate: One (6), Two (6), Three (0), Four (6); Postgraduate (2)
<b>Subject</b>	Business (8), Humanities (6), Education (3), Sciences (3)
<b>Prior education</b>	High school (8), Diploma (2), Degree papers (5), Degree (5)
<b>Employment</b>	Full time (11), Part time (3), Casual (1), None (3), Full time mother (2)
<b>Dependents</b>	None (11), One (1), Two or three (5), Four or more (3)

## Methodological decisions

This section expands on some of the methodological decisions and challenges associated with researching the student experience whilst endeavouring to maintain a strong sense of the learner's voice. In particular, it describes some of the issues and decision points that arose from adopting a phenomenological approach to data collection and analysis. Phenomenology is concerned with describing events as one experiences them by placing a person's experience at the centre of any investigation. Although the role of the researcher in phenomenology can be problematic as they cannot be entirely neutral, the intention is to seek to understand the essence of something as experienced by the participant.

Of the many methods and techniques of gathering qualitative data, some are more suited to phenomenology than others. Methods with a closer affinity to the approach include interviewee narratives, participant observation, and reflective diaries, to name a few. The current study was partially inspired by a method designed by Cashmore, Green and Scott (2010) who gathered video diary data with undergraduate students at the University of Leicester. They provided participants with small, hand-held video cameras and asked them to submit a minimum of a five-minute video diary on a weekly basis. In an attempt to minimize interventions during the data gathering process, students were informed that they could focus on any topic, theme or concern that they felt was important to their lives and their student experience. However, amid their commitment to free-flowing ethnographic data collection, Cashmore, Green and Scott acknowledged wide variation among participants with some submitting five minutes every fortnight and others submitting more than 20 minutes every week.

Mindful of the challenges associated with managing and making sense of free-flow video diary data, the research team considered a number of options of how to gather participant contributions in a way that ensured enough consistency in the questions and experiences being explored, whilst remaining true to the intent of trying to understand what it means to be a first-time distance learner from a student's perspective.

In trying to strike a balance between structure and free-flow the study also drew on the ‘Day Experience Method’ employed by the Learning Landscape Project at the University of Cambridge (Riddle & Arnold, 2007). This project had in turn been informed by the ‘Experience Sampling Methodology’ from the behavioural sciences (Hektner et al., 2006). The aim of the Learning Landscape Project was to minimize recall distortion by encouraging participants to provide detailed accounts of their daily experiences over time and capture the ebb and flow of these experiences as they occur in situ. Riddle and Arnold therefore asked participants to diarize the answer to five pre-specified questions (What time is it? Where are you? Who are you with? What are you doing? How do you feel about it?) when prompted via text message every 30 to 90 minutes between 8am and 10pm on three separate days.

After considering the pros and cons of various data collection methods we devised a ‘Reflective Prompt’ protocol that provided some structure but also maintained an element of individual free-flow expression. The protocol requested that each participant would upload at least one five-minute digital video file per week via a secure website (Moodle) to which only the Research Assistant had access. Within 48 hours of a participant uploading their video file, the Research Assistant would transcribe the video data before responding to the individual participant via the project email account (In Your Own Words). The original intention was that the email would contain an amiable yet emotionally detached greeting followed by a set of ‘reflective prompts’ designed to trigger reflections for the participant’s next video diary. In other words, all participants would be encouraged to reflect on their online/distance learning experiences by prompting their thoughts with personalised ‘fish-hooks’ that were based on each individual trajectory, as it emerged over time.

The ‘reflective prompt’ framework aimed to uphold the general principle that phenomena should be allowed to present themselves with minimum influence or imposition from the researcher. Therefore, the framework was structured as follows:

- **Prompt 1:** What’s on your mind at the moment?
- **Prompt 2:** Fish-hooks for learning-related experiences  
e.g. You mentioned an assignment was due. How did that go?
- **Prompt 3:** Fish-hooks for support-related experiences  
e.g. You mentioned waiting for an email response. Any news on that?
- **Prompt 4:** What’s on your plate next week?

However, during the first few weeks of the study it became increasingly apparent that many of the participants were forming a close bond with the Research Assistant. It was quickly apparent that the ‘reflective prompt’ framework and video diary interventions along with the weekly email exchanges with the Research Assistant were having a significant impact on the student experience. The Research Assistant had inadvertently become a default point of contact with the institution and this role was having a positive impact on their sense of belonging as a first-time distance learner. After discussing this situation amongst the research team, and consulting with the University’s Ethics Committee, we did not believe it was

appropriate to reduce the level of interaction with the participants or depersonalise the reflective fishhooks.

## **Data analysis**

A considerable amount of rich qualitative data was collected from all 20 participants during the first six weeks. Originally the research was intended to explore just the first few weeks of study but after realising the positive impact the intervention was having on participants they were given the opportunity to continue until the end of semester. Although continuation of the video diaries beyond the initial six weeks was not part of the original plan as we were primarily interested in the initial stages of the study lifecycle, it was considered potentially unethical to cease data collection at this point. Moreover, we had already learnt from the participants that the provision of student support was crucial beyond the first few weeks of study.

Eight participants chose to conclude at this point, while 12 opted to continue for sixteen weeks – that is, until after the examination period and official end of semester. In total, including this extended period, more than 22 hours of video data were collected, which provided rich insights into the student experience. In order to accurately tell the student's story of their lived experiences of being a first-time distance learner, we employed a six-step thematic analysis (Braun & Clarke, 2003). The six steps are described below:

### **1. Familiarizing yourself with the data**

This step recognises that it is vital for a researcher to immerse themselves in their data to the extent that they are familiar with the depth and breadth of the content. Throughout the study, the Research Assistant transcribed video files within 48 hours of receipt, which was a process that achieved almost 'real-time' immersion. Importantly, the researcher did not attempt to thematicize the data at this stage.

### **2. Generating initial codes**

This step sought to identify and code particular data that appeared relevant to the research objective. Although data can never be coded in an epistemological vacuum, the aim was to discover meanings in the data whilst remaining open to unexpected interpretations. The end of this step was a series of meaning units still expressed in the participant's own everyday language.

### **3. Searching for themes**

This step is where elemental units of coded data were combined to form overarching candidate themes. While we found that some units did not collate naturally with other units nothing was abandoned.

#### **4. Reviewing themes**

At this stage of the process it became evident that some candidate themes did not have enough data to support them. Other candidate themes were better collapsed to form one theme. This was an iterative process that helped us over the course of the semester to more clearly identify the emergent themes.

#### **5. Defining themes**

This step involved identifying the ‘essence’ of what each theme was about by returning to collated data extracts and connecting them together. Of course the problem here is that raw data (i.e. the participant’s story) was transformed at this point by our interpretation, which we could not avoid being influenced by our own stories. Nevertheless, to remain true to telling the participant’s story we sought validation of the full transcripts and endeavoured to share our interpretations with students. The question remains whether the participants truly validated their own data by engaging in this process. Although we had limited control over this aspect of the methodology, wherever possible we tried to use direct quotes as part of larger extracts to encapsulate the full context.

#### **6. Producing the report**

It is important that any written analysis provides a concise, accurate and interesting account of the story that the data tells. To this end we attempted to share enough data extracts to demonstrate the prevalence of each theme, whilst also providing an analytic narrative of discoveries that related to the research questions. Again the challenge during this stage was maintaining the integrity of the participants’ stories within our larger analysis of the meta-story. This issue became more difficult as time elapsed in reporting the findings and the research team became more distant from the original data.

### **Reflecting on key findings**

The lived experience of first-time distance learners presented itself as a complex phenomenon involving a dynamic process of personal adjustment to study amid enabling and inhibiting triggers. We have chosen not to report on the findings in any great detail as they have already been described at length in other publications (Brown et al., 2013). However, three points are noteworthy. Firstly, in terms of preparedness to meet the academic and emotional demands of learning by distance, more than one third of participants were returning to study for the first time since secondary school. Notably, they were returning to study after an interval of more than a decade. From within this sub group, the majority of them struggled to find effective study techniques to meet the demands of university-level study. Notably, few students knew about or took advantage of the support services available for first-time distance learners.

Secondly, a significant period of risk was identified in the second half of semester when the majority of participants began to question their ability to complete their programme of study. During this period, students often resolved to study fewer units (modules) per semester or

concluded that online/distance education did not suit either their approach to learning or their lifestyle at that point in time. This second at risk period highlighted the misperceptions that most students began with concerning the flexibility of studying from a distance.

Lastly, there is a ‘chicken-or-egg’ debate over what comes first: the preference towards an inherently ‘lone wolf’ approach among learners who choose to study by distance; or failings among distance education providers to establish connectedness with and between their students. The insights gained from the sample of first-time distance learners suggest that institutions could do more to challenge student’s self-sufficient conception of what it means to be a distance learner. It is not enough to rely on chance that they will take opportunities to interact with teachers, peers and academic support staff – or even find necessary levels of learning support from people in their immediate vicinity with whom they enjoy an established sense of relatedness.

## **Conclusion**

This study has described how we sought to document the lived experiences of first-time distance learners as seen from 20 participants over a 16-week period. There is, to our knowledge, no other study that has described using the same video diary methodology the *lived experiences* during this key transition in the study lifecycle. In this paper we have focussed on some of the methodological lessons and challenges of doing things better in studying the student experience. Amongst other things this line of research has helped us better understand why the participants chose to enrol via distance learning, which was largely because of circumstance rather than by design. The study observed that only a minority of participants – all with more active and deep learning orientations – spoke in a consistently positive way about the joys of online/distance learning. In contrast, the majority of participants reported notable periods of isolation and despair. They spoke consistently about their first semester as a challenge during which they had struggled to balance study with other work and family demands. Above all this study has helped to personalise the problem of retention to real people and to underscore the imperative of why we need to do things better for this group of students.

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## **FEEDBACK ON ACADEMIC ESSAY WRITING THROUGH PRE-EMPTIVE HINTS – MOVING TOWARDS ‘ADVICE FOR ACTION’**

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### **Abstract**

This paper reports on the SAFeSEA project (Supportive Automated Feedback for Short Essay Answers), conducted by the Open University and Oxford University, which set out to assist students in writing draft essays. The project explored a number of feedback mechanisms to facilitate this process. One such mechanism was investigating how to offer support regarding essay structure, based on the premise that a good essay is like a good story: it needs a beginning, middle and end; the components are also well connected and the middle section of the essay provides the evidence for the argument progressed throughout the essay. This leads to the development of a web-based feedback system called OpenEssayist (Whitelock, Field, Pulman, et al., 2013). In parallel with this technical development, we also investigated whether support could be given to students before they started writing their essays, in the form of ‘hints’. This paper will set out the rationale behind this investigation, the context in which it was addressed, and the conclusions we can draw to confidently assert that such a ‘feed-forward’ approach can have a statistically significant effect on students’ essay marks.

### **Introduction**

It is widely accepted and cited in educational literature that feedback is central to learning (e.g. Black & Wiliam, 1998; Taras, 2003). The debate therefore is constantly evolving to consider what forms of feedback can have the most positive impact, and how this feedback can be offered to students in a way that they will welcome, understand and act on in future work. In essence all learning is a dialogic activity, drawing feedback from all interactions that students associate with course material. What students do with the feedback they receive or perceive will determine how well they can adapt and develop to suit course tasks. Therefore feedback should also be seen (by teachers and students) as one feature in dialogic interaction, rather than an end point after summative assessment – as ‘advice for action’ (Whitelock, 2010). This paper reports a study on the provision of ‘hints’ to participants on how to write academic essays, before they begin their essays. We address this with a view to how this pre-emptive feedback, or ‘feed-forward’ (e.g. Hattie & Timperley, 2007; Price, Handley & Millar, 2011), can have a significant positive impact on students’ work. The present paper is a

response to our research question: How does the provision of hints affect the essay being written, and essay writing in the future?

Butler and Winne (1995) identify that students who are better able to make use of feedback can more easily bridge the gap between their expectations or goals, and performance. Contrary to a common model of offering feedback on submitted work, they also conclude that feedback is most likely to have a positive influence on learning and learning performance when given during a task, rather than waiting until students submit what they believe to be a finished piece. Of course the point at which to provide feedback is affected by the type of task, e.g. a one-time short task, compared to an essay that is drafted and revised over time.

The verdict on feedback however is not entirely positive. Kluger and DeNisi (1996) offered a critical review and meta-analysis of the feedback literature, stating that a positive effect of feedback on subsequent performance is far from universal, even though it may appear to be represented this way in the literature. Whilst Kluger and DeNisi’s paper was written almost 20 years ago, it is important that we still heed its warning not to assume feedback will automatically be beneficial. We draw on their finding however that a ‘feedback intervention’ (in our case offering ‘hints’ to participants before they write essays) will be beneficial if it supports learning and helps learners to set goals (Kluger & DeNisi, 1996). This is further supported by Hattie and Timperley’s (2007) conclusion that ‘When goals have appropriate challenge and teachers and students are committed to these goals, a clearer understanding of the criteria for success is likely to be shared.’ (p.89)

Within the study to be reported here, the ‘hints’ given to students prior to their essay-writing refer to general guidance on how to structure an academic essay. The hints provided were content-free, and so broadly appropriate to all academic writing in any subject without extra strain and time demands for tutors. This has the advantage that they can be shared with large numbers easily, but the disadvantage that they are not tailored to learners’ current subject understanding and individual learning needs.

In other research hints have been given as responsive prompts, at assumed points of need during task activity (e.g. Quintana, Zhang & Krajcik’s 2005 review of software facilities), but not as general supportive information prior to tasks. Also hints tend to be short, in response to a potential error, omission or misunderstanding. Beaumont, O’Doherty and Shannon (2011) offer a qualitative report of students’ experiences of receiving ‘preparatory guidance’ on tasks whilst at school or college, but with no experimental exploration of this aspect. Beaumont et al.’s study also focused predominantly on students progressing to university study straight after A-levels, without a gap in their academic pursuits. Further to this, Hattie and Timperley (2007) provide a review of the research field, and conclude that provision of ‘cues’ can offer guidance to students for ongoing work:

*‘Such cues sensitize students to the competence or strategy information in a task or situation. Ideally, it moves from the task to the processes or understandings necessary to learn the task to regulation about continuing beyond the task to more challenging tasks and goals’ (p.102).*

Again however, this work did not report any experimental trial of the effects of providing ‘cues’ or ‘hints’ on immediate and subsequent essay writing.

In work with 10-14 year old school students, Narciss (2013; Narciss et al., 2014) reported an experimental trial on the automated provision of ‘hints’ within short mathematics tasks. Hints were provided after errors had been made in a task, but prior to a further attempt at the same task. The hints were therefore pre-emptive, to support future performance and learning, but were also a direct response to an error. Hints were designed to offer either conceptual or procedural guidance. In doing this work Narciss recognised that there is little research, theoretical or empirical, on ‘automatic feedback adaptation’, which is similar to our interpretation of the existing literature. Given the nature of the tasks tested within Narciss’ studies, being in the mathematics domain and specifically working with fractions, students’ responses were relatively easy to identify as correct or incorrect. As Narciss acknowledges, this is not the case within less structured tasks, such as essay writing which is the context we address in our work, and so the nature of feedback needed is significantly different.

In the study to be reported here, we uniquely offered broad macro-level guidance to participants on how to write a ‘good essay’ before they wrote their essay, rather than focusing on the aspects that might identify their work as a ‘bad essay’. Participants each wrote two essays. For one essay they were given hints before writing. Half of the participants received ‘essential’ hints before writing one of the essays (and no hints before writing the other). The other half received ‘nonessential’ or ‘helpful’ hints before writing one essay (again receiving no hints before writing the other essay). Participants’ performance was marked against set criteria. This enabled us to explore whether there was an effect of giving hints for the immediate essay, and also whether there was a lasting effect of this provision.

To explore this context, we investigated the following research questions:

1. Is there a difference between essay writers’ performance due to giving or not giving hints?
2. Is there a difference between essay writers’ performance due to the type of hint given?
3. Is there a transfer evident in essay writers’ performance due to the point at which hints are given?

We will now outline our method, including details of the sample and tasks, and will respond to the three research questions within the conclusions that follow.

## Method

### Participants

Fifty participants were recruited from a subject panel maintained by colleagues in the Department of Psychology at the Open University, consisting of people who were interested in participating in online psychology experiments. Some of them were current or former students of the University, but others were just members of the public with an interest in psychological research. The 50 participants consisted of eight men and 42 women, who were aged between 18 and 80 with a mean age of 43.1 years.

### Procedure

The participants were assigned in rotation to one of four groups as they signed up to take part in the study. Each participant was asked to write two essays, and in each case they were allowed two weeks for the task. The first task was: “Write an essay on human perception of risk”. The second task was: “Write an essay on memory problems in old age”. Participants who produced both essays were rewarded with an honorarium of £40 in Amazon vouchers.

Groups 1 and 3 were provided with hints for Essay 1 but not for Essay 2. Groups 2 and 4 were provided with hints for Essay 2 but not for Essay 1. Groups 1 and 2 were provided with essential hints. Groups 3 and 4 were provided with helpful hints as shown in Tables 2 and 3 below. Otherwise, the participants were provided with no feedback on their essays. Table 1 illustrates the research design.

Table 1: Research design

	<b>Group 1</b>	<b>Group 2</b>	<b>Group 3</b>	<b>Group 4</b>
<b>Essay 1</b>	Essential hints	No hints	Helpful hints	No hints
<b>Essay 2</b>	No hints	Essential hints	No hints	Helpful hints

Two of the authors who were academic staff with considerable experience in teaching and assessment marked the submitted essays using an agreed marking scheme and without reference to the groups to which participants had been assigned. The marking scheme is shown in the appendix. If the difference between the total marks awarded was 20 percentage points or less, essays were assigned the average of the two markers’ marks. Discrepancies of more than 20 percentage points were resolved by discussion between the markers.

### Data analysis

A mixed-design analysis of variance was carried out on the final marks that were awarded to participants who submitted two essays. This employed the within-subjects variables of hints (hints versus no hints) and marking criteria (1–10) and the between-subjects variables of hint type (essential versus nonessential) and hint order (hints on Essay 1 versus hints on Essay 2). Post hoc tests were carried out to identify the marking criteria on which any significant changes in marks had arisen as a result of providing hints.

Table 2: 6 essential essay writing hints

1	Read the question carefully and underline keywords in the question to focus on the main areas that you need to address for the essay.
2	Make a plan for your essay. For example, create a list of salient points that will address the key points from hint number 1.
3	Remember, an essay is telling a story. A good story has a beginning, middle and an end. These are also known as introduction, discussion points and conclusion. Ensure this structure is explicit in your answer.
4	The introduction should set out a basis for your discussion/argument.
5	The discussion section picks up on the introduction, elaborates upon it and provides evidence for the points mentioned within it.
6	The conclusion should summarise the discussion points and ends with a decisive stance towards the essay topic that you’ve been asked to write about.

Table 3: 6 nonessential essay writing hints

1	When you have written your first draft, pick out 10 words or phrases that you think are the most important ones in your essay. Do you think they convey the ideas you want to express in this essay?
2	Topic sentences are those that give an outline of the contents of a paragraph. Do you have topic sentences to cue the reader into the major points you are trying to make in this essay?
3	Read your draft and identify any supporting sentences. Their function is to cue the reader into details of one of the arguments in a paragraph.
4	Ensure that your conclusion is a summary of the main argument of the essay. The conclusion may often have an opinion or a recommendation too.
5	Check your word count. If you have too many words, see if any of the paragraphs in your essay discuss things that aren’t directly relevant to your assignment question. If so, delete them.
6	Are any of the paragraphs in your essay longer than 7 sentences? If yes, consider carefully whether all the sentences are necessary for you to clearly make your point.

## Results

All 50 participants submitted Essay 1, although only 45 participants submitted Essay 2. The correlation coefficients between the marks initially awarded by the two markers were .81 for Essay 1 and .77 for Essay 2. In six cases, the discrepancy between the two markers was more than 20 percentage points, and these discrepancies were resolved by discussion between the markers. The mean final mark for Essay 1 was 56.9 ( $SD = 15.1$ ), and the mean final mark for Essay 2 was 54.5 ( $SD = 15.9$ ). Table 4 shows the mean marks awarded for essays with and without essential and nonessential hints.

Table 4: Mean marks with and without essential and nonessential hints

	<b>n</b>	<b>No hints</b>	<b>Hints</b>
<b>Essential hints</b>	23	54.8	56.5
<b>Nonessential hints</b>	22	53.6	60.0
<b>Overall</b>	45	54.2	58.2

The main effect of hints was statistically significant using a directional test (equivalent to a one-tailed Student’s *t* test),  $F(1, 41) = 3.23, p = .04, \text{partial } \eta^2 = .07$ . Table 4 shows that on average essays written with hints received 4 percentage points more than essays written without hints. This constituted a “medium” effect based on Cohen’s (1988) benchmarks.

There was no significant effect of hint type,  $F(1, 41) = .08, p = .78, \text{partial } \eta^2 = .00$ , and no significant interaction between the effects of hints and hint type,  $F(1, 41) = 1.09, p = .30, \text{partial } \eta^2 = .03$ . Thus, there was no difference between the benefit of essential hints and that of nonessential hints. In fact, Table 4 shows that if anything the benefit of nonessential hints tended to be greater than the benefit of essential hints.

There was no significant effect of hint order,  $F(1, 41) = 1.24, p = .27, \text{partial } \eta^2 = .03$ , and no significant interaction between the effects of hints and hint order,  $F(1, 41) = 1.68, p = .20, \text{partial } \eta^2 = .04$ . In other words, there was no difference between the benefit of hints provided for Essay 1 and the benefit of hints provided for Essay 2. This in turn implies that there was no transfer of the effect of hints provided for Essay 1 on the writing of Essay 2.

There was no significant interaction between the effects of hint type and hint order,  $F(1, 41) = 0.94, p = .34, \text{partial } \eta^2 = .02$ , and no significant three-way interaction between the effects of hints, hint type and hint order,  $F(1, 41) = .09, p = .76, \text{partial } \eta^2 = .00$ .

The main effect of criteria was statistically significant,  $F(9, 369) = 20.86, p < .001, \text{partial } \eta^2 = .34$ , which is unsurprising since different numbers of marks were awarded against the ten criteria. However, there was a significant interaction between the effect of hints and the effect of criteria,  $F(9, 369) = 2.25, p = .02, \text{partial } \eta^2 = .05$ . Thus, the benefit of hints varied across the ten criteria. This too constituted a “medium” effect based on Cohen’s (1988) benchmarks.

Post hoc tests were carried out to identify where the increase in marks as a result of providing hints had arisen. Directional tests showed that there was a significant increase in marks on Criterion 1 (introduction) from 5.43 to 6.77 out of 10,  $F(1, 41) = 4.59, p = .02, \text{partial } \eta^2 = .10$ , a significant increase in marks on Criterion 2 (conclusion) from 6.10 to 7.43 out of 10,  $F(1, 41) = 12.50, p < .001, \text{partial } \eta^2 = .23$ , and a significant increase in marks on Criterion 4 (evidence) from 8.00 to 9.03 out of 20,  $F(1, 41) = 3.22, p = .04, \text{partial } \eta^2 = .07$ . These constituted medium or large effects on Cohen’s (1988) benchmarks. Otherwise, there were no significant differences between the marks awarded to essays written with and without hints.

## **Conclusions and implications**

This study is unique in conducting an experimental trial to evidence that essays written with hints, as ‘advice for action’, gained higher marks than those written without hints. Whilst much research has suggested that this might be the case, to our knowledge no-one has previously tested this in such a way. We are also able to report the statistically significant finding that the higher marks gained for essays written with hints were due to better performance with regard to the introduction, conclusion and use of evidence within essays.

This is of vital importance in terms of the quality of academic writing, as good essays require a strong beginning, a middle that is coherent and an end that brings the whole essay together, and the statistics reported here reflect that these elements significantly improved with provision of hints. A particular strength of this paper is that it set these issues up to be tested, offering hard evidence to support theory, not just ‘hooray words’ that we can all agree with in principle but cannot test in practice. In terms of efforts to improve the quality of students’ academic writing, these findings have substantial implications for feedback research and practice. As the hints provided were content-free, this approach could easily be made more widely available, with the potential to benefit course designers, tutors and students on a much larger scale.

This evidence also supports the approach adopted in the development of OpenEssayist (Whitelock et al., 2013), the automated feedback tool on students’ draft essays where key words and sentences are displayed as they appear in the text, designated by introduction, main text and conclusion sections of the essay. This again emphasises that a good essay has key phrases connected together from the beginning through to the middle and finally presented at the end of the essay, drawing together an excellent conclusion.

An important direction for future research needs to be further experimental investigation of how to frontload support for students, in the form of ‘advice for action’ before they begin assignments. This is critical as students starting new courses, particularly those who have been out of study for a while, may well understand the topic of study, but not how to approach the task – novices are unlikely to be aware of what they do not know. Telling them afterwards that they have done it wrong is potentially demoralising, and ultimately of little benefit in terms of course performance. More effort therefore needs to go into supporting students to understand task requirements beforehand, so that they can approach tasks confident that they know what they are doing, and that their efforts are aligned with tutors’ expectations. An experimental trial of this scenario is precisely the direction in which we intend to take our ongoing work.

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## Appendix

Marking criteria: 100 marks in total

<b>Criterion</b>	<b>Definition</b>	<b>Maximum marks</b>
1. Introduction	Introductory paragraph sets out argument.	10
2. Conclusion	Concluding paragraph rounds off discussion.	10
3. Argument	Argument is clear and well followed through.	10
4. Evidence	Evidence for argument in main body of text.	20
5. Paragraphs	All paragraphs seven sentences long or less.	5
6. Within word count	Word count between 500 and 1000 words.	5
7. References	Two or three references Four or more references	5 10
8. Definition	Provides a clear and explicit definition of risk or memory.	10
9. Written presentation	Extensive vocabulary, accurate grammar and spelling.	10
10. Practical implications	Understanding of practical issues, innovative proposals.	10
Maximum total marks		100



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## **“ARE THEY READY?” EXPLORING (NON-TRADITIONAL) STUDENTS’ SELF-DIRECTED LEARNING READINESS AND THEIR ACCEPTANCE OF E-LEARNING TOOLS**

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### **Introduction**

The profile of students attending traditional brick and mortar universities is increasingly diverse, which constitutes a challenge for the institutions that need to adapt their teaching practices, contents and learner support structures to accommodate these so called “non-traditional” students’ (NTS) needs (Kerres, 2012). Albeit this challenge, taking this diversity and its changes that shape today’s student profile into account to offer a successful learning experience to the students. Subsequently, Morrison, Ross and Kemp (2007) state: “As designers, we need to understand the relevant characteristics of our learners and how those characteristics provide either opportunities or constraints on our designs” (p.52). This also applies to teaching and learning in the online distance education context, for which the investigation of “the socio-economic background of distance education students, their different learning styles, critical thinking dispositions, and special needs” (Zawacki-Richter, 2009, p.9) was identified as a central research area. Successful and productive distance education depends on and demands learners – among other factors – to be intrinsically motivated and be capable of self-directed or self-regulated learning: “As the online learning environment is characterized with autonomy, self-regulation becomes a critical factor for success in online learning” (Barnard et al., 2009, p.1). This paper investigates the differences in self-directed learning readiness of non-traditional and traditional students in German higher education as well as the acceptance of digital teaching and learning approaches with respect to their self-directed learning readiness.

### **Theoretical Background**

“Self-directed learning” and “self-directed learning readiness” are complex constructs and there are many different definitions. A well-known definition by Knowles (1975) describes self-directed learning as “a process in which individuals take the initiative, with or without the help of others, in diagnosing their learning needs, formulating learning goals, identifying human and material resources for learning, choosing and implementing appropriate learning strategies and evaluating learning outcomes” (p.18). Consequently, self-directed learning

readiness refers to the “attitudes, abilities and personality characteristics” (Wiley, 1983, p.182 as cited in Fisher et al., 2001, p.517) that the learner needs to apply to his or her learning process. Self-directed learning has been identified to be one of the central components in the theory of adult education (Merriam, 2001). In literature, several similar terms, e.g. self-regulated or self-organised learning, exist and are sometimes used synonymously for self-directed learning. This subsequent vagueness is addressed by e.g. Bucholc (2010), who attempts to distinguish more strongly between the terms and their different meanings. As early as 1978, Guglielmino developed a scale to measure this self-directed learning readiness, her scale being later subject of methodological criticism (Bonham, 1991; Field, 1989).

Studies have reiterated the importance of self-directed learning in higher education settings (e.g. Smedley, 2007) and beyond (e.g. Robertson & Merriam, 2005). However, a critical stance towards this topic can be observed as well (Kraft, 1999): “Theories on self-directed learning are not consistent, there is a lack of clear and precise theoretical definitions of terms and delineation, the arguments for this form of learning are of varying quality and plausibility, the empirical findings are diverse and the situation regarding data is diffuse and unclear” (translation by the authors) (p.834). This challenge cannot be addressed further in this study, but nonetheless has to be taken into consideration.

Transferring self-directed learning readiness to online distance education means to directly addressing the fact that “studying at a distance requires maturity, a high level of motivation, capacity to multi-task, goal-directedness, and the ability to work independently and cooperatively” (Brindley, 2014, p.287). Thus, self-directed learning plays an important role (Song & Hill, 2007). As a general fact, knowing learners’ characteristics and abilities proves to be important in online learning when designing and offering web-based courses meeting these needs (Morrison et al., 2007; Zumbach, 2010); even more so given the fact that today’s student population is increasingly diverse regarding age, professional and personal background, and prior education experience (Thompson, 1998; Guri-Rosenblit, 2012; Stöter et al., 2014).

Nevertheless a clear definition of the so called “non-traditional student”, does not exist. A range of understandings, however, share some common points as the following exemplary definitions show but also differ in focus. Ely (1997) delineates non-traditional students through the following characteristics: “I am your adult student, age 25 or older, who has returned to school either full-time or part-time. While attending school I also maintain additional adult life responsibilities such as employment, family, and financial commitments” (p.1). More characteristics are included in the definition by the National Center for Education Statistics (NCES) in the United States: “delayed enrolment into post-secondary education, attended part time, financially independent, worked full time while enrolled, had dependents other than a spouse, was a single parent, did not obtain a standard high school diploma” (Horn & Carroll, NCES, 1996, p.2). Having at least one of these characteristics classifies students as non-traditional students in US statistics. For this study the classification by Zawacki-Richter, Hohlfeld and Müskens (2014) was used.

## **Research Questions**

The aim of this study is to analyse whether there exists a difference between the self-directed learning readiness of non-traditional and traditional students. Following the assumption outlined above, the diversity of today’s students along the differentiation of being traditional or non-traditional possibly shows in their self-directed learning readiness.

Thus, the central research questions of this investigation are:

- Do traditional and non-traditional students show different levels of self-directed learning readiness?
- Does a relationship exist between the self-directed learning readiness of these two groups and their acceptance of e-learning tools?

If this is the case, then

- How can this difference be described and what consequences arise for the development of educational settings that rely on the extensive use of e-learning tools?

## **Method**

### ***Sample and Data Collection***

Data in this analysis is taken from a large quantitative study on students’ use of media, which was conducted in 2012 in the framework of “Aufstieg durch Bildung – offene Hochschulen”, a large-scale program funded by the German Federal Ministry of Education and Research and the European Social Fund (Zawacki-Richter, Hohlfeld & Müskens, 2014). The study aimed at identifying university students’ usage patterns when deciding on which (digital) media, tools, and services to use in the context of their studies. In total, 2,339 students from over eleven German higher education institutions answered the online questionnaire, providing information on diverse aspects of their media use in the context of their university studies, their learning styles as well as central socio-demographic characteristics<sup>1</sup>. With a gender distribution of 61% female and 39% male participants, aged 25 on average, one of the central characteristics of the participant group is their differentiation along the line of being considered a non-traditional student or not. Non-traditional students were defined in this study as such when meeting at least one of the criteria of enrolment in an (online) distance education programme, studying part-time, being employed for at least 19 hours per week, or being 30 years and older (Zawacki-Richter et al., 2014).

One central result of the study emerged to be the classification of four media user types, described by Zawacki-Richter & Müskens (2013, p.11) entertainment user (51.6%), peripheral user (20.1%), advanced user (20.4%), and instrumental user (7.6%) (N=1715). Here, Zawacki-Richter & Müskens (2013) show that: “NTS had a much greater mean class probability for the

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<sup>1</sup> For an extensive description of the questionnaire used and participating students’ profile, see Zawacki-Richter, Hohlfeld & Müskens (2014) or Zawacki-Richter & Müskens (2013).

‘instrumental users’ class than TS. For the ‘peripherals’ class the mean class probability of the NTS was significant higher, too. However, the NTS had significantly smaller mean class probabilities than TS with regard to the classes ‘entertainment users’ and ‘advanced users’” (pp.12). So far, the survey’s data on self-directed learning readiness of the participating students has not been analysed further.

Attention needs to be paid to the fact that the study participants are enrolled in higher education institutions in Germany, the structure and environment of which is distinctly different from that of other countries. Thus, this context is to be taken into consideration when analysing the data.

### ***Instrument***

In the media usage study, questions concerning the participants’ self-directed learning readiness were taken from Fisher’s et al. (2001) self-directed learning readiness scale and were translated from English to German by the researchers. Fisher et al. developed their own self-directed learning readiness scale in response to the critique on the validity of Guglielmino’s scale (Field, 1989) and Bonham’s (1991) doubt on whether the scale measures readiness for self-directed learning or rather for learning itself (reliability of the scale). Primarily developing the scale for the field of nursing, they reviewed the existing literature and employed the Delphi technique to define and validate the scale’s items. It was intended, however, that their scale be used in other contexts as well. The final scale comprises three subscales, “self-management”, “desire for learning”, and “self-control” and consists of 40 items related to these topics. Students can rate their perceived self-directed learning readiness on a five point Likert scale (ranging from 1=strongly agree to 5=strongly disagree).

### **Preliminary Findings**

The three subscales “self-management”, “desire for learning”, and “self-control” were summarized as one and labelled as “self-directed learning readiness total”. The mean of this new variable was calculated for both non-traditional and traditional students. Non-traditional students were operationalized as such when fulfilling at least one of the criteria that were listed and already used by Zawacki-Richter et al. (2014); traditional students are students who did not fulfil any of these criteria.

Table 1: SDLR\_Total for non-traditional and traditional students  
(1=strongly agree, 5= strongly disagree)

<b>Student Type</b>	<b>N</b>	<b>mean</b>	<b>standard deviation</b>
Traditional	1,531	2.120	0.420
NTS	789	1.975	0.424
total	2,320	2.071	0.427

The results show that with a mean of 2.071, the level of total self-directed learning readiness is high for both groups. However, participants identified as non-traditional students perceived

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their self-directed learning readiness slightly higher (1.975) than the traditional students (2.120).

The group of non-traditional students was then more narrowly defined, operationalizing them through the fulfilment of the criteria of being 30 years and older *and* enrolled in an education program offered fully online in order to take into consideration that the various criteria of NTS may have a very different impact on students needs and learning styles.

Table 2: SDLR\_total with 40 Items for NTS\_narrow and TS+NTS\_rest  
(1=strongly agree, 5=strongly disagree)

<b>Student Type_NTS_narrow</b>	<b>N</b>	<b>mean</b>	<b>standard deviation</b>
NTS_narrow	38	1.845	0.382
Traditonal+NTS_Rest	2282	2.074	0.427
total	2320	2.071	0.427

Using a definition of NTS, which includes more than one criterion, the difference to TS regarding the self-directed learning readiness is still very small, although the narrow definition results in even higher SDRL ratings for NTS. In order to investigate if there could be a relevant implication the effect sizes were calculated.

Effect sizes are a quantitative measurement tool to give an idea of the practical relevance of differences in means, therefore the results can be compared in a more differentiated way (Bortz & Döring, 2006). According to Cohen (1988), as a first orientation, effect sizes of under  $d = 0.20$  can be neglected, from 0.50 on they are considered as medium and from 0.80 on as high. The effect size for NTS\_narrow is calculated to be  $d = 0.565$ . Applying the broad definition of NTS, the effect size of 0.34 indicates an effect, even though a small one. When specifying this definition (“narrow” definition of NTS: only online students and those older than 29 years old), the effect size increases: The value is within the medium range, however, it needs to be taken into consideration that only 38 cases were included.

### ***Interpretation***

The results clearly indicate that differences in the self-reported estimate of self-directed learning readiness between the groups of NTS and TS exist, although they are rather small. In this case, this could be due to the fact that the criteria age and study format were used. Most likely, the fact of studying online accounts for this effect size. At the same time, the broad and initial definition of non-traditional students diminishes the difference between this group and the traditional students. It is possible that the definition of NTS used here is too broad to allow for discovering substantial differences to the TS group. This is supported by the result that, when using the narrower definition, a medium effect size (according to Cohen) can be found, i.e. a bigger difference concerning the self-directed learning readiness. It has to be recognized, that the criteria in the given definition of NTS do have different impacts: an age of more than 29 and being enrolled in an online-only-program is not the same and may indicate that inside the group of NTS a more differentiated approach is needed. Another explanation for these

results could be that students in general show a rather high self-directed learning readiness. However, analyzing students’ self-directed learning readiness is only the first step. An investigation of the domains in which this readiness plays a role when designing the actual educational settings and technology, is necessary.

### **Analysis of acceptance of digital learning tools**

Thus, in the following the acceptance of digital learning approaches will be analyzed. The study by Zawacki-Richter et al. (2014, p.20) used the differentiation for media and tools provided by Grosch and Gidion (2011) according to which digital learning approaches are summarized as follows: “1) course-complementing materials, 2) interactive, multimedia learning materials, 3) virtual seminars and tutorials with tele-cooperation, 4) lectures in the form of pod- or vodcast, 5) virtual practice and laboratories, 6) online tests and tutorials (e-assessment), 7) web-based trainings / trainings in the intranet or internet, 8) e-portfolios / learning diaries in the intranet or internet.”

A 2-factor variance analysis with SDLR-scale (full) as independent variable and the factors „student type” and „acceptance digital learning approaches” (categorized) was conducted.

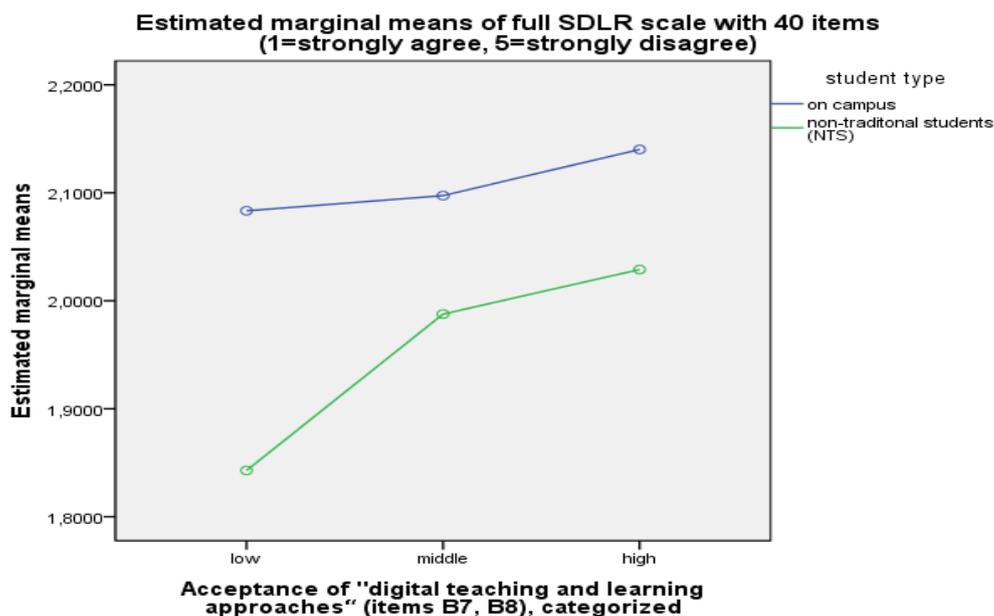


Figure 1. SDLR-scale as independent variable and the factors „student type” and „acceptance digital learning approaches”

The results show that there is a small difference, which is however not significant but does show some tendencies. NTS show more self-directed learning readiness whether the acceptance of digital teaching and learning approaches is low, middle, or high. Students with the lowest acceptance of digital teaching and learning approaches show the highest self-directed learning readiness. The higher the self-directed learning readiness, the lower the acceptance.

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### **Interpretation**

According to the acceptance of digital learning approaches of non-traditional students, it can be found that especially the students with very high SDRL rates have a lower acceptance for online learning tools and formats. The small differences in the SDRL ratings between the two groups are not influenced by the acceptance of digital learning formats and the degree of acceptance is not an appropriate criterion to show differences of SDRL ratings within the groups. The statistical insignificance could be due to the broad definition of non-traditional students.

Furthermore, the results are obtained by analyzing data from students enrolled in German higher education; thus, an internationally applicable generalization is not possible.

### **Conclusion**

The results of this study allow different conclusions and leads to further hypotheses: it is possible that the group of university students as such has (generally) a higher willingness to learn in a self-directed manner. Regarding the construct of self-directed learning, it would thus be interesting to compare the values/indexes of the students to those of other societal groups or learners in other educational settings (e.g. secondary schools, vocational education).

Considering the design of teaching and learning in higher education, this would mean that non-traditional and traditional students are or will be rather similar in some characteristics relevant for the instructional design and share a lot of the same needs regarding study modes. Increasing the flexibility of educational offerings in higher education will therefore be an advantage for all groups of students. The results of the study “STUBE” (<http://mediendidaktik.uni-due.de/stube>) support this interpretation by showing that traditional students, in addition to non-traditionals, would like to have more flexible learning opportunities in terms of time and tools (e.g. Stöter, 2013).

To what extent the construction of the scale might have influenced the results needs also to be taken into consideration. All items are positively phrased. (e.g. „I enjoy studying”, „I learn from my mistakes”, “I am able to focus on a problem” etc.), making a bias (in positive direction) predictable when rating the statements. A tendency to rate items according to social desirability is likely as well. Criticism that was already directed at Guglielmino’s (1978) scale (e.g. Bonham, 1991) also leads to the question of what exactly is measured by the scale provided by Fisher et al.: is it self-directed learning or rather e.g. the attitude towards learning itself? A subsequent review of this scale in terms of its validity and reliability should be considered, and if necessary, it should be adapted or modified accordingly.

Finally, future research could possibly include comparative studies on students’ self-directed learning readiness who are enrolled in higher education systems other than the German one. Taking into consideration different learning styles, cultural aspects could here be a fruitful addition to investigate this important construct.

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## THE INFLUENCE OF EMOTION ON COGNITIVE PRESENCE IN A CASE OF ONLINE MATH COACHING

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### Abstract

The Math Coach program provides help with mathematics instruction using online coaching. Instructive communication using text-based CMC with additional whiteboard capacity is used. Coachees range from sixth to ninth year of compulsory school, and upper secondary school (aged 12–19). Coaches are enrolled from students at teacher training colleges. Stenbom, Cleveland-Innes, & Hrastinski (2012) introduced a framework for analyzing online coaching called the Relationship of Inquiry. That framework is a modification of the well-researched and verified theoretical framework the online Community of Inquiry (Garrison, Anderson, & Archer (2000, 2001). Transcript analysis of Math Coach conversations indicates that emotional expression is a natural part of the practical inquiry process that constitutes cognitive presence.

### Introduction

Wood, Bruner and Ross (1976) described the coaching or tutorial process as “the means whereby an adult or ‘expert’ helps somebody who is less adult or less expert” (p.89). Bloom (1984) found that average students in an individual tutoring condition obtain test scores as high as the top 2% students in a classroom condition. In a meta-analysis of findings from 65 evaluations of school tutoring programs, Cohen, Kulik and Kulik (1982) showed that the programs had positive effects on academic performance and attitude to the subject matter of those receiving tutoring. They also found that the children who served as tutors had better understanding of and more positive attitudes to the subject matter.

A model entitled the Relationship of Inquiry (RoI) framework was developed to provide a deeper understanding of one-to-one online tutoring. It is built on the widely accepted online Community of Inquiry (CoI) framework (Garrison et al., 2000; 2001), is based on the work of Peirce (1955) and put in an educational context by Lipman (1991). The RoI framework is based on four interdependent elements: cognitive, teaching, social, and emotional presence. The framework and elements is described below. To date, the RoI framework has been tested and verified in an online math tutoring setting. The adapted cognitive, teaching, social and emotional presence measures achieved an acceptable level of reliability (Stenbom et al., 2012).

Findings suggest the adapted online inquiry framework is a good fit for describing one-to-one online tutoring.

Emotional presence has been suggested as an element worth exploring in online environments. It has been suggested that the present location of emotions in the CoI, currently defined as a part of social presence, can be questioned (Garrison & Akyol, 2013). Cleveland-Innes and Campbell (2013) suggested a possible four element framework adding emotional presence as “the outward expression of emotion, affect, and feeling by individuals and among individuals in a community of inquiry” (p.283). As described above, this additional presence is included in the RoI framework, and is a central element in this study.

Central for critical higher-order thinking is the component of cognition. Cognitive presence has been defined “as the extent to which learners are able to construct and confirm meaning through sustained reflection and discourse in a critical community of inquiry” (Garrison, Anderson & Archer, 2001, p.11). If emotions are considered as a natural component of inquiry, critical higher-order thinking includes emotion, affect and feeling. It is therefore reasonable to further investigate the influence of emotion on cognitive presence.

This study is guided by the following research questions:

1. To what extent is a combination of cognition and emotion present in online math tutoring?
2. Are there differences between the amounts of emotion expressed during different parts of the cognitive process of inquiry?

## **Background Information**

Denis, Watlan, Pirotte and Verday (2004) reviewed literature on online tutoring and defined the e-tutor as “someone who interacts directly with learners to support their learning process when they are separated from the tutor in time and place for some or all these direct interactions” (p.1). Kopp, Matteucci and Tomasetto (2012) surveyed 76 online tutors from 17 European countries. Experienced online tutors were defined as those that emphasized the importance of collaborative activities. They used specific cognitive activities to support online collaboration and were more familiar in detecting and intervening to avoid dysfunctional social behaviour. Hampel and Stickler (2005) suggested a number of skills necessary for successful synchronous online tutoring: “dealing with the technology and using its advantages, the social skills of community building, language teaching skills, and the skills to teach creatively and develop a personal teaching style in an online medium” (p.311).

This personal style is likely to include expressed emotion, a normal part of the human experience and a likely response to experiencing challenges in the math skill development process. This relationship between emotional expression and cognitive processes is of central interest to this segment of our research. For centuries the dispassionate thinker who applies logic and reason to pursue truth has been the ideal towards which learners are encouraged to

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strive. Emotion is perceived, at worst, as a hindrance to learning, and, at best, a learning outcome in the affective domain. Dirks (2008) made a case for the integration of feeling into adult education. That impassioned argument is the impetus for our work on the role of emotion in online learning.

Palloff and Pratt (2003) recognize that emotion plays a role in online communication. They advise the use of emoticons – participant generated symbols intended to represent emotions – as a tool to compensate for the absence of tone of voice and body language during text-based Internet-mediated learning. However, the affective domain and emoticons address only indirectly the pervasive presence of emotion in online learning.

Conrad (2002) vividly recounted the tumult of feelings, including anxiety, which accompany the online experience. Garrison, Anderson and Archer (2000) proposed a theoretical construct for online learning that entailed three “essential elements” (p.88): cognitive presence, social presence and teaching presence. Those authors posited that emotional expression is an inherent aspect of social presence. In their Community of Inquiry (CoI) model, emotion evolved from an outcome to an essential quality of online learning. Although the model is intuitively satisfying, the position that emotion is merely a domain-specific component, and not a process that serves as a sub-text for learning, fails to go far enough in dealing with the role emotion plays in online learning environments.

Also indicated by Garrison, Anderson and Archer (2000) and represented in the RoI model, is the actual process of learning labelled cognitive presence. This element is outlined by the practical inquiry model, which describes the process of critical thinking and consisting of four vital components: triggering event, exploration, integration and resolution (Garrison et al. 2001). For the RoI where there is one-to-one online coaching, a triggering event is something that motivates a learner to contact an educator to get help – as well as the stating of the problem or issue in a conversation. The exploration is characterized by a review of the learner’s previous knowledge, brainstorming and the exchanges information. Integration involves the connection of these two events. In the resolution phase, ideas are put together to form an accepted meaning. A typical example in math tutoring is the math calculations. Resolution includes the actual solving of the problem or issue and analysis of solutions.

### **Data Collection and Analysis Methods**

This case study tests the use of an adapted theoretical model of interaction in online teaching and learning. The case involves an instructional opportunity for students who require just-in-time assistance completing their math homework, as assigned by their own math teacher at their own school. We used content analysis of electronic logs in order to get a more thorough understanding of how emotional presence is articulated in online math coaching.

A total of 60 logs from math coach conversations were selected out of the 7640 logs from the year 2012. Logs were analysed using the individual message as the unit of analysis as a message usually contains a few words with one joint intention (Garrison, Cleveland-Innes, Koole &

Kappelman, 2006). A coding scheme, displayed in Table 1, had been developed following the CoI coding template complemented with emotional presence. In the coding procedure logs were coded for with cognitive, teaching, social, emotional presence along with their sub-categories.

Table 1: The Relationship of Inquiry coding scheme

Element	Category	Indicators (examples only)
Cognitive presence	Triggering event	Stating a problem, changing direction.
	Exploration	Brainstorming, broad search for insights, information exchange.
	Integration	Connecting ideas, computations.
	Resolution	Achieve solution, analysis of solution, implementation.
Teaching presence	Design & Organization	Establishing interaction, setting parameters for the inquiry.
	Facilitating discourse	Stimulating constructive inquiry, assessing process.
	Direct instruction	Providing steps to solution, summarizing the discussion.
Social presence	Open communication	Acknowledging, trivial expressions.
	Relationship cohesion	Greetings, praise, vocatives, building links.
Emotional presence	Activity emotion	Emotion about the inquiry.
	Outcome emotion	Emotion about the consequence of the inquiry.
	Directed affectiveness	Emotion towards the other person.

Two persons independently coded half of 60 logs each. Then 10 logs were coded by both coders for reliability calculations. A message was coded, when applicable, with more than one category to follow the idea of overlapping elements in the framework. After performing the coding procedure all messages coded with emotional presence and coded with more than one code was chosen.

## Findings

A total of 3109 messages were coded in this analysis. Out of the 3109 messages, 2241 messages were coded with one element, 832 were coded with two elements and 36 were coded with three elements. The number of double-coded messages including emotional presence was 480. Out of the 36 triple coded messages 30 included emotional presence. The distributions with the other elements are presented in Table 2 and Table 3.

Table 2: Number of double-coded elements including emotional presence

	Cognitive	Social	Teaching	Emotional
Emotional	135	58	281	6

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Table 3: Number of triple-coded elements including emotional presence

	<b>Cognitive</b>	<b>Social</b>	<b>Teaching</b>	<b>Emotional</b>
Cognitive	1			
Social	4	1		
Teaching	0	19	2	0
Emotional	0	3	0	0

In order to investigate the interactions between emotional presence and cognitive presence the specific combination of these elements was selected. Since only 5 messages were triple-coded with combinations of emotional and cognitive presence it was decided to only include double-coded messages in the further analysis. For double-coded messages a total of 135 messages were found. Table 4 displays the number of messages and outline the distribution of the messages among the four categories of cognitive presence and the three categories of emotional presence.

Table 4: Number of double-coded elements of cognitive and emotional presence

	<b>Triggering event</b>	<b>Exploration</b>	<b>Integration</b>	<b>Resolution</b>
Activity emotion	9	49	4	7
Outcome emotion	0	1	0	0
Directed affectiveness	8	47	5	5
Total	17	97	9	12

The final step of the analysis was to examine the occurrence of emotions throughout the four elements of the cognitive process outlined by the practical inquiry model. This was done using messages double-coded with emotion and the categories of triggering event, exploration, integration and resolution presented in Table 4. That data was then normalized by dividing with the total number of messages that was coded with the categories of cognitive presence during the coding procedure. The comparatives were calculated as the percentage of the total presence per category that was double-coded with a category in emotional presence. The result is displayed in the Table 5.

Table 5: Percentage of messages coded with categories of cognitive presence also coded with emotional presence.

<b>Category</b>	<b>%</b>
Triggering event	12.84
Exploration	17.24
Integration	4.93
Resolution	10.53

These findings indicates that emotion is a part of all the four categories of cognitive presence, hence a part of the entire practical inquiry process. The distribution is, however, uneven throughout online math tutoring. Most emotional is exploration where 17.24% of the total number of messages coded was also coded with emotional presence while for integration 4.93% of the messages included emotions.

## Discussion

These findings provide more evidence that emotions are evident in an online learning environment (Brookfield, 2006; Zembylas, 2008; Dirkx, 2008) by revealing emotions associated with all three other presences identified in an online RoI. Although text-based communication is a more limited medium to express emotions compared to face-to-face communication, online students develop new ways to express themselves emotionally. Similar to other studies, the students in this study used paralanguage (i.e. emoticons, punctuation, capitalization), adopted a less formal more personal and expressive tone or used figurative language (e.g. Meyer, 2003; Swan & Shih, 2005; Delfino & Manca, 2007; Lord & Lomicka, 2008) to exhibit both positive and negative emotions related to all areas of cognitive presence, but during exploration in particular.

## Conclusion

The identification of emotional presence as a substantive, significant influence in online learning environments is an important finding in this study. More important is the relationship suggested by the combination of emotional presence in reference to cognition. Emotion was identified more often in cognitive presence than social presence, but less so than in teaching presence. Across elements of cognitive presence, as identified by the practical inquiry model, emotional expression varies. Emotion is more prevalent during the early phases of cognitive processing: the experience of a triggering event and the exploration toward understanding. The integration of this experience into past learning demonstrates the least amount of expressed emotion. The resolution of a cognitive event involves greater expressed emotion than during the integration phase, but less than during the triggering event and exploration phases of cognitive presence.

Further research is needed to continue to verify and explicate the existence of emotion in online learning. Beyond acknowledging its existence, the amount, character, and impact of emotion in reference to online learning must be identified. From this research, practice implications for online instructional design, facilitation and instruction with consideration to possible emotion response and expression can be outlined.

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## **FACULTY SATISFACTION IN AN ONLINE LEARNING ENVIRONMENT: A CARIBBEAN UNIVERSITY PERSPECTIVE**

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### **Introduction**

The Sloan Consortium (2002) regards faculty satisfaction as a “critical building block of quality in online education and stresses its effects on faculty motivation and its importance to enhancing students’ learning experiences”. Moreover, Sherron (1998) is of the opinion that “the ultimate success or failure of the distance education enterprise is inextricably tied to the enthusiasm and continued support of the faculty” (p.44). Of note also, is that “most of the emerging empirical research on Asynchronous Learning Networks (ALNs) has focused on students, but the assessment of faculty roles and characteristics that influence their satisfaction with ALNs has received limited empirical attention” (Hiltz, Kim & Shea, 2007, p.2). This research, therefore sought to investigate factors which contribute to faculty satisfaction and promote rich learning environments and high quality teaching experiences. In contrast, factors related to faculty dissatisfaction were also explored. The five factors: student, personal, institutional, administrative and technological were investigated with the view of promoting efficient and effective planning and decision making of administrators and policy makers.

Cognizant of the various forms of online environments and faculty structures in various universities, there is particular need to define online teaching and learning as they relate to this research. To this end, the term Asynchronous Learning Networks (ALN) has been adopted as purported by Hiltz et al. (2007). This comprises Computer-Mediated Communication (CMC) systems that allow “anytime” communication via the Internet, using software platforms such as course management systems, computerized conferencing, or bulletin boards that support threaded discussions (p.1). Additionally, the “Learning Networks” aspect “refers to the social network or community of learners that emerges when students and faculty communicate and work together to build and share knowledge” (ibid, p.1).

In terms of faculty, The University of the West Indies (UWI) Open Campus is unique in comparison to its three sister campuses, since it does not employ full time faculty but contracts ‘adjunct faculty’ such as lecturers and qualified content experts from the other UWI campuses, external campuses (regional and international) and private and public organizations. There are presently three categories of adjunct faculty responsible for the teaching of online courses: E-Tutors, Course Coordinators and Group Facilitators. The

E-Tutors are the course instructors while the Course Coordinators supervise the work of the E-Tutors and lend assistance with instruction when necessary. The term Group Facilitator is a relatively new title and such persons may perform the role of either Course Coordinator or E-Tutor.

With regard to faculty satisfaction, Bolliger and Wasilik (2009) are of the opinion that it is a “complex issue that is difficult to describe and predict but defines it as “faculty’s perception that teaching in the online environment is effective and professionally beneficial” (p.105). For the purposes of this study, faculty satisfaction is defined as the extent to which faculty perceive student, personal, institutional, administrative and technology factors as effective.

### ***Significance of the Study***

The importance of investigating faculty satisfaction cannot be underestimated since it is one of the integral components of quality online education. Further, faculty satisfaction can influence student success and satisfaction, faculty involvement and retention and programme development and quality. Moreover, a clear understanding of the factors which promote faculty satisfaction can enable administrators and policy makers to retain adjunct faculty, contribute to quality programs and enhance the reputation of their institutions (Palmer, 2011, p.18-20).

### ***Purpose of the Study***

Mindful of the importance of faculty satisfaction to the online teaching and learning environment, the purpose of this study is to determine the overall level of faculty satisfaction, and identify factors contributing to and hindering their satisfaction. The study is not only important but also timely since “there have been a relatively small number of prior empirical studies of faculty satisfaction with teaching” (Hiltz, Kim & Shea, 2007, p.3). The study is therefore guided by the following research questions:

- What is the overall satisfaction level of adjunct faculty?
- Which factors most contribute to the satisfaction of adjunct faculty members?
- Which factors least contribute to the satisfaction of adjunct faculty members?
- What differences exist in the satisfaction levels of adjunct faculty by age, sex and job title?
- How can UWI Open Campus improve the online delivery process?

### ***The Context of the Research***

The University of the West Indies (UWI) first introduced distance education (DE) in 1983 with the establishment of the University of the West Indies Distance Teaching Experiment (UWIDITE) via its audio teleconferencing system. Through UWIDITE, tertiary education and training became more accessible, especially to the citizenry of the Eastern Caribbean. Improvements continued and on August 1, 1996, the amalgamation of the Distance Education Unit, Challenge, and UWIDITE was completed, giving rise to the Distance Education Centre

(DEC). A further amalgamation was completed in 2008, resulting in the birth of the UWI Open Campus (UWIOC), which provides fully online, blended and face to face programmes to primarily meet the needs of the underserved and underprivileged in the Eastern Caribbean.

The UWIOC is the fourth and newest of the UWI campuses. The other three campuses are located in Trinidad and Tobago, Barbados and Jamaica. The UWI Open Campus was primarily established to provide tertiary education to the non-campus Caribbean countries. Unlike the other three campuses, the UWIOC primarily provides online education so that students can remain in their countries and access quality tertiary education. In addition to its online facilities, the UWIOC comprises thirty-three country sites (the former Schools of Continuing Studies). These country sites provide asynchronous and synchronous online support as well as face-to-face support for students. Face-to-face support from country site personnel also include areas such as registration, academic advice, and where needed, face-to-face tutoring. At these sites, there is also access to resources such as tele- and video-conferencing facilities, computer labs and libraries.

Online support at the UWIOC is facilitated by a team of online personnel which consists of Programme Managers, Course Coordinators, Learning Support Specialists and E-Tutors. Online services also include academic advising as well as access to virtual library resources. Course tutors, apart from their initial training, also receive support from the Instructional Development Coordinator as well as all the other above mentioned personnel. It is in this context that the current study was conducted.

## **Literature Review**

The literature is replete with factors which contribute to job satisfaction and dissatisfaction. These include but are not limited to age, gender, student peer interaction, student instruction interaction, course content, technology and remuneration. Bolliger and Wasilik (2009) further categorized these factors into three groups: student related, instructor related and institution related (p.106). For the purpose of this research, however, student, personal, institutional, administrative and technology factors are explored.

### ***Student factors influential to faculty satisfaction***

Bolliger and Wasilik (2009) in their study of 102 distance education faculty noted that “student satisfaction is an important element in the investigation of faculty satisfaction” (p.105). Further, the research of Belcheir and Cucek (2002), in their study of 254 postsecondary distance education faculty, suggested that increased student interaction is positively correlated with faculty satisfaction (Palmer, 2011, p.47). Bolliger and Wasilik (2009) also report that researchers (Fredericksen et al., 2000; Hartman et al., 2000) have established a positive correlation between faculty satisfaction and student performance (p.106). In this study, the student factors investigated include student participation in their learning, student-student and student-faculty interaction, and student technological skills.

### ***Personal factors influential to faculty satisfaction***

For the purpose of this research, personal factors refer to the faculty's level of competence in technology, their level of creativity in the use of online resources, interaction with and response to students' individual skills gained from training and their perception of teaching online versus face to face. Bolliger and Wasilik (2009) state that "faculty satisfaction is positively influenced when faculty believe that they can promote positive student outcomes" (p.106). If faculty perceives that they are competent in their use of technology, sufficiently creative in their use of online resources, proficient due to acquired training, comfortable with their level of student interaction and favour online teaching, it is likely that they will be satisfied in their role.

### ***Institutional factors influential to faculty satisfaction***

Faculty satisfaction is generally high when the institution values online teaching and has policies in place that support the faculty. Palmer (2011) cites Oomen-Early and Murphy (2009) who contend that "external variables external to the instructor that are mediated by the educational organization can interfere with, and potentially dissuade many instructors from distance education program" (p.49). In this regard, Palmer (2011) refers to a number of institutional/organizational factors which have been found to be influential to faculty satisfaction. These include workload, training, and adequate course preparation time. Bolliger and Wasilik (2009) also refer to institution-related factors such as workload, adequate compensation and an equitable reward system and the quality of courses (p.106). This study investigated the institutional factors purported in the literature but also included the institution's assessment practices; access to quality teaching resources; student load and faculty inclusion in decision making. Further, Satterlee (2008) quotes Bower (2001) who asserts that "among potential online adjuncts, there is some trepidation as to the adequacy of institutional support" (p.23).

### ***Administrative factors influential to faculty satisfaction***

Administrative factors which are closely related to institutional factors were separated to provide the institution with specific evidence pertaining to general administrative support and the response time of Programme Managers, Programme Course Delivery Assistants, and Learning Support Specialists. Satterlee (2008) cites Hagedorn (2000) who states that "there are facets of a job that lead to satisfaction or dissatisfaction that are under the control of university administrators" (p.9). When an adjunct is not physically present on a campus, the support provided by colleagues, administration and staff is important. Satterlee (2008) holds the view expressed by Visser, Smets, Oort, and Hanneke (2003) and Freeborn (2001) "that an employee's perception that they are well managed and well resourced will lead to job satisfaction" (p.23).

### ***Technology factors influential to faculty satisfaction***

When faculty experience technology difficulties or do not have access to adequate technology and tools, their satisfaction is likely to decrease (Bolliger & Wasilik, 2009, p.106). Apart from the course curriculum, there must be a robust technological infrastructure to support, facilitate and enhance quality online delivery. This view is further emphasized by the Sloan Consortium (2002), which is of the view that the satisfaction of faculty is maintained and enhanced when provided with adequate institutional support and a well-maintained technical infrastructure.

## **Methodology**

### ***Data Collection Instrument***

A forty-six (46) item online survey of faculty satisfaction with online course delivery was developed and administered via Survey Monkey to collect data on demographics (*online position, sex, age range, online teaching experience, title of course taught, and affiliate UWI campus or other job title*) and perceptions of faculty satisfaction based on institutional factors (11 items); student factors (5 items); technology factors (6 items); personal factors (10 items); and administrative factors (4 items). The survey also comprised one open-ended item: *How can UWI Open Campus improve the online delivery process?* The survey was designed based on the constructs derived from the literature and scale items were compared to other instruments published in the literature. The data were collected on a 5-point Likert scale: Very Satisfied (5); Satisfied (4); Moderately Satisfied (3) Dissatisfied (2); and Very Dissatisfied (1).

### ***Sample***

The subjects were a convenience sample of E-tutors, Course Coordinators and Group Facilitators who were contracted during Semester 2 of the 2012-13 academic year and those who had been previously contracted within the past three years. Of the 345 faculty members who received surveys, 249 responded, hence a response rate of 72% was achieved. Table 1 illustrates the characteristics of the sample.

Table 1: The characteristics of participants

<b>GENDER (n = 249)</b>	<b>Total</b>	<b>Percentage</b>
Male	51	20.5
Female	198	79.5
<b>AGE RANGE (n = 249)</b>	<b>Total</b>	<b>Percentage</b>
Under 25 years	3	1.2
26-35 years	74	29.7
36-45 years	60	24.1
46-55 years	74	29.7
56-65 years	33	13.3
Over 65 years	5	2.0
<b>JOB TITLE (n = 249)</b>	<b>Total</b>	<b>Percentage</b>
E-Tutors	163	65.5
Course Coordinators	70	28.1
Group Facilitator	16	6.4
<b>ONLINE TEACHING EXPERIENCE(n =245)</b>	<b>Total</b>	<b>Percentage</b>
0-1 year	70	28.6
2-5 years	94	38.4
6-10 years	72	29.4
11-15 years	8	3.3
16-20 years	1	0.4

### **Data Analysis**

Descriptive statistics such as frequencies, mean scores and percentages were used primarily to analyse the research questions. Further, thematic coding was applied to the participants’ open-ended responses to ascertain their level of satisfaction pertaining to the factors investigated.

### **Findings**

#### **Question 1: What is the overall satisfaction level of adjunct faculty?**

Participants were asked to indicate their level of satisfaction as it relates to their overall teaching experience. The survey findings as illustrated in Table 2 revealed that faculty was generally satisfied with their online teaching experience as demonstrated by an overall mean score of 4.05, from a maximum of 5.00. Male faculty were slightly more satisfied (4.12) than their female counterparts (4.03).

Table 2: Faculty overall satisfaction by gender

Overall teaching experience	<b>Gender</b>			
	<b>Male (n=50)</b>		<b>Female (n=196)</b>	
	Mean	SD	Mean	SD
	4.12	0.746	4.03	0.686

**Question 2: Which factors most contribute to the satisfaction of adjunct faculty online delivery experiences?**

Table 3: Faculty's satisfaction levels with the five components

<b>Factors of Faculty Satisfaction</b>	<b>N</b>	<b>Mean</b>	<b>SD</b>
Personal Factors	239	3.09	0.732
Student Factors	238	3.07	0.861
Administrative Factors	241	4.18	0.756
Technology Factors	243	4.07	0.781
Institutional Factors	241	3.71	0.802
Overall	249	3.62	0.786

Based on Table 3, faculty was most satisfied with administrative factors with a mean score of 4.18. This indicates that faculty was very satisfied with the response times of Programme Managers, Course Delivery Assistants, Learning Support Specialists and the general administrative support in the online environment. Based on the calculated percentages for the Likert scale responses (Very satisfied and Satisfied), faculty was most satisfied with the response times of Programme Course Delivery Assistants (90.4%) and Programme Managers (90%). The percentage levels of satisfaction for the Learning Support Specialists and general administrative support in the online environment were also high with percentages of 85.6% and 82.8% respectively. Of note also is the mean score of 4.07 for technology factors. For this subscale all six items registered satisfaction levels above 75%. The item with the highest level of satisfaction (90.2%) was *'the ease of access to my online courses'* [Very satisfied 44.5%, Satisfied, 54.7%].

**Question 3: Which factors inhibit the satisfaction adjunct faculty online delivery experiences?**

On the contrary, faculty was least satisfied with student factors with an overall mean score of 3.07. The item: *'students' participation in online discussions'* recorded the lowest percentage score of 26.3%; [Very satisfied 4.2%, Satisfied, 22.1%]. By comparison, the items with the highest percentage score: *'the level of student-faculty interaction'* was 45.7%.

**Question 4: What differences exist in the satisfaction level of faculty by age, sex and job title?**

Table 4: Mean Scores for the Faculty’s Levels of Satisfaction with the Five Satisfaction factors by AGE RANGE

Factors of Faculty Satisfaction	AGE RANGE											
	Under 25 (n=3)		26-35 years (n=70)		36-45 years (n=58)		46-55 years (n=70)		56-65 years (n=29)		Over 65 years (n=4)	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Personal	3.74	0.713	3.94	0.742	3.98	0.784	4.01	0.658	3.98	0.732	4.07	0.674
Student	3.00	0.662	2.87	0.910	3.14	0.847	3.20	0.744	3.17	0.887	2.90	1.282
Administrative	4.42	0.577	4.05	0.666	4.14	0.888	4.25	0.712	4.32	0.783	4.44	0.672
Technology	4.44	0.481	3.95	0.805	4.08	0.780	4.13	0.703	4.18	0.811	3.92	1.36
Institutional	3.99	0.843	3.54	0.759	3.64	0.794	3.68	0.775	3.73	0.854	4.09	0.821
Overall	3.92	0.655	3.67	0.776	3.79	0.819	3.85	0.718	3.88	0.813	3.88	0.962

Generally, the satisfaction levels across age ranges were relatively stable ranging from mean scores of 3.67 (26-35years) to 3.92 (under 25’s). For individual factors, the under 25 age-range scored the highest mean scores of 4.44 and 4.42 for technology and administrative factors respectively. Of note also, is that all age ranges were least satisfied with student factors. Scores ranged from 2.87 (26-35 age range) to 3.20 (46-55 age-range). With regard to gender, the overall mean score of 3.69 was recorded for both male and female participants. Similarly, the overall mean score of 3.77 was consistent for E-Tutors, Course Coordinators and Group Facilitators.

**Question 5: How can UWI Open Campus improve the online delivery process?**

Faculty suggested a number of ways to improve online delivery. These include a salary increase for faculty; introduction of more flexible training schedules; the institution of more consistent practices in course delivery and timely handover of course content. Faculty further suggested a decrease in faculty- student ratio; improvement in student participation; introduction of measures to ensure student readiness and improve student technology competencies; the creation of a more user-friendly Learning Exchange; and improvement of technology support, especially to new faculty members.

**Conclusion**

There is no doubt that online education is fast becoming an integral component of higher education. This reality is very much evident in the Caribbean and more specifically at the UWI Open Campus. In this regard, it is imperative that the issue of quality is not compromised and that students receive the best possible online experiences. Hence, the satisfaction of faculty is important since they play such a pivotal role in ensuring and maintaining the delivery of quality online education. Hence, this study investigated the satisfaction level of adjunct faculty based on their overall online teaching experiences and personal, institutional; technological, institutional and administrative factors. The findings revealed the following:

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- Faculty were relatively satisfied with their online teaching experiences, with mean scores (maximum of 5.0) of 4.12 for male faculty and 4.03 for their female counterparts.
- Faculty was most satisfied with administrative factors (4.18) and least satisfied with student factors (3.07).
- There were minimal differences in regard to satisfaction levels of faculty by age, sex and job title.

Additionally, faculty made plausible suggestions for the improvement of online delivery. Inclusive but not exhaustive, were recommendations to increase faculty remuneration; introduce more flexible training schedules; institute more consistent practices in course delivery and timely handover of course content. Further suggestions were to decrease faculty-student ratio; improve student participation; introduce measures to ensure student readiness; implement measures to improve student technology competencies; create a more user-friendly Learning Exchange; and improve technology support, especially to new faculty members.

These recommendations are in keeping with the extant literature and should prove helpful to administrators and policy makers. As noted by Bolliger and Wasilik (2009), “faculty satisfaction ... is important and needs to be continuously assessed to assure quality online educational experiences for faculty and students” (p.114).

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## **CROSSROADS AND CHALLENGES FOR RESEARCH INTO A MASSIVE DISTANCE LEARNING PROGRAM: UBA XXI**

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### **Global Positioning System (GPS): Providing location and legacy for open and distance learning**

The GPS will allow the understanding of open and distance learning in Argentina. I selected three dimensions to provide location and summarize the legacy in this field. The first dimension refers to the high interest of our academic teachers for innovation, improvement of their practices and development of new dispositives for the students learning. In Argentina we have over twenty eight years offering distance learning in higher education, having trained human resources along those years and with interaction between us through the distance along the country. The second dimension consists in the network that we generated around all the open and distance programs developed in Argentina for public universities. On 1990 took place the first gathering in the city of Buenos Aires with the participation of representatives of the national universities from the provinces of: Buenos Aires, Salta, Santa Fe, San Juan, Chubut, the city of Buenos Aires and the technological university (UTN). As a result of that reunion came to life “RUEDA”, the university network for distance education in Argentina. The acronym is formed from the initials of the components (Red Universitaria de Educación a Distancia de Argentina) and generates in Spanish language the word “Rueda” which in English means wheel. “RUEDA” gives the spirit of movement and the beginning of the collaborative work still alive through the years. The third dimension to consider is the high interest of the academic community to be in contact with international prominent professors and experience international programs around the world.

### **General characteristics of the open and distance learning program UBA XXI**

The general characteristics of the distance learning program UBA XXI encompass the opportunity to develop and create an open access for more students that could access the university level and start studies at the Universidad de Buenos Aires (UBA). Located in the city of Buenos Aires this university was created in 1821 being public and completely free (The postgraduate courses only requires a tuition free). Four of the Argentines Nobel Laureates were students of this university in different disciplines. The UBA has thirteen faculties offering seventy eight higher careers and four hundred of postgraduate courses. Data from the

last census (2011) totalizes 262,932 students and 67,445 which are doing their first studies at the university.

UBA XXI was developed in 1985 in a historical moment with the beginning of democracy in Argentina after years of *de facto* governments. The program was designed and created by Professors Edith Litwin and Alicia Camilioni as an alternative for the students to complete the common core cycle to join the UBA in a distance and open learning program. Currently, UBA XXI has over twenty eight years of existence. The students may choose the option to participate in this open and distance learning program instead of a regular class “face to face”. By doing the program some of the students anticipate their entrance to the university while they are studying in high school. Some students select the program while they are working and others because they live away from the city, in other provinces.

The program is structured in two semesters and the students select the academic subjects for each period. The extension of each subject could be four months and recently we had incorporated some intensive summer courses with an extension of six continuous weeks during the months of February and March. Since its beginning UBA XXI program has shown a characteristically steady growth on both the number of students, who are interested in the proposal for distance learning, and academic subjects offered in the program.

Some highlights of the programme’s growth were online registration in 2005 and the access to a virtual training campus in 2009. Comparing some data from the first initial student enrolment in the program in March 1986 of 3,304 students to March 2013 of 27,828 students, it results a growth rate of 842%.

An additional side of growth in terms of enrolment has been seen recently with the opening of the intensive summer option courses which generated an enrolment growth of 419% between years 2012 and 2013.

The pedagogical design of UBA XXI includes: specially written material for the distance learning program published by its own editorial (Eudeba), options of tutorial “face to face classes” at different campuses of the university spread in the city of Buenos Aires (92 options of tutorials), a virtual campus with access to forums, chat, videos, guides with general orientation, auto tests, reading guidance, study guides, radio programs for each subject broadcasted by “Radio UBA” and YouTube channel, access to social UBA XXI networks Facebook and Twitter. We must also consider the human resources involved in the daily task of the program: teaching coordinators, educators, pedagogic area, the media and communication areas which produce teaching resources and the design of radio programs, the management of virtual platform, twenty three learning centres geographically distributed in the provinces of Buenos Aires, Tierra del Fuego and Entre Ríos, the administrative management of the modality, the support of students, and the human resources area. All this issues supported by a team of 150 professionals, tutors, administrative and technical staff. The assessments of the students are the only personal attendance chore. They take place in different venues in Buenos Aires city and in the learning centres among the country. Our last

enrolment process 2014 showed for the first semester 30,431 students, and for the second one 26,194, totalizing 56,525 students in the program during for the year 2014. About 30% are foreign students most of them from Brazil, Colombia, Perú, Chile, Bolivia, Uruguay, Venezuela and some few from the European continent.

## **Conditions for research into a massive university program of distance and open learning**

Crossroads and challenges for research into a massive university program generate some questions: What is the place for research in a program of such features? How is displayed the role of the researcher in such circumstances? Litwin defined technologies as means for enhancing understanding so then we could imagine research into massive university distance learning as an engine for inclusion, allowing a pluralistic thinking, leading to the creation of research communities that achieve a process of progressive improvement of distance learning and even we may go a step further. Go that step further carries risks, uncertainties and requires a high degree of creativity. Research within the UBA XXI Program has been present since the foundation times as an area dedicated to search the best practices and interventions, a place to share with other teachers, promote distance education, explore new technologies, analysis of the perceptions of students and teachers, observe classroom practices of mentoring and reviewing the different pedagogical instances.

Actually the research area seeks the support of teaching, analyzing practices and innovation. Some of the questions we face: how to create the conditions for research to be linked to educational practices? How is the relationship between research and teaching practices? There are certain research models that facilitate these conditions by creating bridges that are built when students, teachers, and administrators meet together.

## **Reflection on research tensions and crossroads**

The research into a distance learning program presents some tensions in the practice when it seeks to bridge the gap making the distance closer giving visibility of the students. At the same time we are part of the distance learning team and we are sharing with other colleagues the program. A summary vision about research in education when technology is included may be expressed as: “we are using technologies that are constantly changing, the metaphor in the research is like to go chasing the horse on a race and we are trying to ride the horse galloping all the time” (Litwin in Pérez & Imperatore, 2005). The research in distance learning is accompanying technological changes so one of the first tensions might be considered as: **the promptly inclusion of new technologies in the distance learning programs.**

The second tension refers to the time required for a research design and the management of time inside a learning program as the later responds to academic calendars with carefully precise times. The research process requires certain timing that in many occasions is not

supported by the timing of educational proposals: **the different logic of managing of time in a research and an educational process could be considered another tension.**

A possible third tension includes the necessity of **differentiation between research and pedagogical improving practices**, assuming that when the intention is to understand or explain what happens in a process, in a situation, in a social practice then we are in a perspective of research. Now if as teachers, we want our students could learn without difficulty, we may establish that we intend to improve the conditions of teaching and learning, but this is not research. It is improving practices. Research can come to understand for example why the student appropriates what he learns and how he appropriates, and when he appropriates, why he rejects to learn or why he is not interested, but it is not necessarily the intention to improve relations between teachers and students. We would be then, therefore, in a perspective of research (Ardoino, 1997).

We may consider as the forth tension for research in a distance learning program **the articulation of the concepts of “proximity and distance”**. We may consider both concepts as dimensions to be studied, not as opposites, but as a current tension present for research in distance learning. The distance learning dispositive in a massive university program is characterized by the virtual interaction between students and teachers, through chats, forums or videos conferences. As the number of students increases through the years in the program the virtual asynchronous environments are privileged instead of direct contact in the distance learning dispositive. Research in distance learning seeks to establish proximity to understand the situational conditions of distance learning, requires direct contact as we interview students and teachers in a face to face situation, as a get-together for possible study. On certain occasions this proximity could be bridged by technology.

One last tension I would like to mention consists about **the role of the researcher when he is a member part of the distance learning program**. The role of researcher leads us to transit on uncertainty roads that bring us to that crossroads venue. Much more than two paths may be crossing and the dilemma is which one might be chosen. Moreover there is an extra tension when the role of researcher is carried out at the same time being a member of the distance education program. How to separate the roles if the researcher is at the same time a member responsible of the program? As Henry Bergson mentioned, how difficult is to separate one from the other, it would be like pausing the song in an effort to hear clearly the melody, if then it disappears (Minuchin & Fishman, 1984).

## **Impact and validations within the colleagues**

The impact and validations within the colleagues are always a social commitment when researching. These questions: What is being investigated? For what reason? For whom? How we research? Which areas are priority to be studied: policies and strategies, focused on teaching and learning or the use of technology? Are the ones that make sense in a discovery context that refers to the socio-politic, institutional and academics factors? Developments should emerge in consensus with social movements, not only researchers must understand

desktop, the research design decisions should be shared with stakeholders and knowledge should be a frame that links scientific knowledge with the everyday (Sirvent, 2003). We find, then ourselves as professionals, not only in the quest to generate more knowledge, but also trying to achieve a more just and equal society. Within the UBA XXI program we have been setting a research model willing to listen and share with students and teachers. Aimed at disseminating and generate mutual interest with teachers and tutors. It is still building open and collaborative bridges inside the program. We believe that the emphasis should be on the dialogue nature, involving teachers and educators, with openness to their needs and proposals, whereas if it is judged if their impact is understood, can be implemented. The researcher seeks to promote research questions for teachers and educators on the way to challenge their practices. We are trying to answer those questions arising from practice in dialogue with teachers, working with real-life problems, seeking alternatives to solve everyday problems where praxis demands immediate decisions or at least in the shortest time possible.

Some possible validations to be considered:

- Create conditions for establishing complicity and solidarity in the pursuit of knowledge and thus make the other feel that minimum shake that is generated in the research process.
- Inquiry about the determination of the agenda for research into a massive distance learning program.
- Generate fusion of horizons, create new meanings, and search the formation of interdisciplinary teams.
- Select designs with more empirically based studies.
- Participate in the creation of research repositories as a database into research in distance learning shared with other institutions and agencies.
- Build the identity of action research in a new virtual environment.

*“There is an age in which we teach what is known, but immediately comes another age in which we teach what is unknown: it is called research ...”*  
(Barthes, 2003)

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## CLUSTERING BASED RECOMMENDATION OF PEDAGOGICAL RESOURCES

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### Introduction

In France, seven DTUs (Digital Thematic Universities) allow open access to more than 24,000 OERs (Open Educational Resources). A DTU is a thematic repository of OERs, all validated by the academic community and indexed using SupLomFR (the French declaration for higher education of the LOM standard). The available pedagogical resources are of various nature (case study, lessons, exercises, simulation, virtual experimentation, additional materials to lessons, pedagogical kit, serious game, self-assessment, etc.) and various formats (pdf, audio, video, interactive or multimedia document, 3D, ...). Each OER can be freely accessed from the DTU's portal, at any moment, by anybody, from everywhere. The main difficulty for a learner is to find the resources linked with his/her pedagogical objectives and his/her thematic background, when browsing the huge offer provided by a DTU. 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 is important to assist the user by a recommender system that suggests pertinent and adequate resources to him/her. In addition, it is more important to assist user in the context of open education.

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. Books are classified by themes. A user's request will be related to the theme which matches it the best. Our recommender system works on the same way: it classifies the UOH, (uoh.fr) the DTU dedicated to humanities, dataset in clusters (themes) in order to give recommendations according to the theme of interest of the user. If, because of the scarcity of resources in a specific theme, the user has already seen all the available resources, then the recommender will have nothing to suggest. In this scenario, the librarian's knowledge about close or linked themes allows to ensure nevertheless a high quality of recommendation. The question is how to do that automatically? The main difficulty of the task is that users are not registered, and we only can use the information collected during the current session for a given user.

This paper describes a recommender system 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, if available. The interest of using information such as disciplines and keywords is to recommend the most adequate resources. 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 scarcity of resources: a problem appears when the last resource viewed by a user is an isolated resource (no similar resource in terms of keywords and disciplines exists).

Knowledge about relationships between clusters can be automatically built by an unsupervised machine learning approach. Therefore, we use a clustering approach not only for its advantages as mentioned in Kim and Yang (2004) and Sarwar et al. (2002), but also to compute metadata about a dataset of resources, e.g. to build classes of resources and to determine links between classes. This knowledge presents a great advantage to solve the scarcity problem. It is the reason why we decide to recommend resources according to their description and also to their metadata.

Due to our applied characteristics and objectives, no method of clustering (Ghribi et al., 2010) is a better candidate for our use case than I2GNG (Improved Incremental Growing Neural Gas) (Hamza et al., 2008a; Hamza, 2008). The dynamic clustering of I2GNG and its capacity to build connection between classes, are the main advantages for our choice. I2GNG allows taking into account, in real time, the change and update done in the dataset. The results of I2GNG shows the distribution of resources and their scarcity, and the provided clusters are made up of a set of similar resources, which can be used by the recommender. Another advantage is that this model-based recommender system requires less processing time than one based on all resources descriptions, because the number of clusters is less than the number of resources. In summary, the use of I2GNG has fourfold objectives:

1. analysis scarcity of resources,
2. ensure the quality of prediction,
3. build knowledge-based recommender and
4. ensure scalable knowledge: clusters and connections between clusters.

The paper is organised as follows: Section 2 presents the related works. Our methodology is presented in Section 3. The results of the adjusted I2GNG algorithm are illustrated and discussed in Section 4, using a corpus provided by UOH. In Section 5, we conclude the paper and points work direction.

## **Related Works**

As our approach focuses on accuracy prediction in e-learning context, by exploiting meta-data of resources, we present works focusing on predicting accurately, e-learning clustering and the existing approaches to index and exploit knowledge.

As showed by several works, such as Kim and Yang (2004), clustering of resources provides a higher quality of prediction, in studying the improvement of the quality of prediction, based on some attributes for each item. After comparing several neighbour selection methods, the authors conclude that the quality of the prediction of a recommender is improved by

clustering resources. The recommendation approach used in Sarwar et al. (2002) is based on a clustering of users. The authors propose an algorithm called "clustered neighbourhood formation", and the experimentations show that a recommendation system based on clustered neighbourhood has a higher quality of prediction because of the automatic improvement of clusters. Gribi et al. (2010) propose a clustering algorithm named "refined neighbour selection algorithm (RNSA)". The algorithm uses the Pearson correlation coefficient between users, the transitivity of similarities and also the attributes of items. After experimentation and comparison of different methods of neighbours selection, the authors conclude that clustering-based recommender system using both refined neighbour selection and attributes can solve the large-scale problem of predicting accurately, without decreasing the prediction quality.

In the context of e-learning clustering, the clustering method is chosen according to the use case, such as available information. Kim and Yang (2005) cluster educational digital library in using LCA (Latent Class Analysis) (Xu et al., 2013), and shows that LCA provides better results than k-means algorithm (Magidson & Vermunt, 2004). LCA clustering is based on different types of parameters, but in our case, we have only the description of resources and no information about users. Lelu (1994) uses parallel affinity propagation (AP) to cluster large scale of e-learning resources. The experimentation shows that the clustering accuracy increases with the number of clusters. Unlike I2GNG, the statistical method AP does not allow to conserve meta-data about resources.

We distinguish two approaches of indexation:

1. Semantic description of resources and users profile, *e.g.*, through ontology models (Wang et al., 2008; Khribi et al., 2008). For pedagogical resources, the standard used to index the UOH resources is SupLOMFR ([www.sup.lomfr.fr](http://www.sup.lomfr.fr)), which is based on an ontology. Coupling this ontology with a reasoning engine allows to index knowledge. The semantic reasoning becomes more complex when several factors (such as concepts and properties in the ontology) are taken into account.
2. Machine learning which refers to classification either unsupervised or supervised by experts (Manouselis et al., 2010). The use of machine learning (Golemati et al., 2007), as clustering methods, allows the extension of clustering-based recommendation, to knowledge- based recommendation.

The knowledge can be defined mathematically by building it automatically (based on a dataset), with I2GNG (Hamza et al., 2008a; Hamza et al., 2008b). The building process of the model by I2GNG, is based on available resources, and can update automatically the model, by creating gradually new classes, new connections, or removing existing classes and connections.

## Methodology

Most of the time, the similarity between two resources is computed using the cosine similarity. Two resources are even closer that their similarity is high. As an illustrative example based on the UOH corpus, the nearest resource of the resource  $r_1$  is  $r_2$  according to the cosine similarity  $(r_1, r_2) = 0.083$ . The similarity between  $r_1$  and  $r_2$  is very low, *i.e.*, they are different resources, and we can verify it manually by opening their Web page of resources. We observe clearly that disciplines and keywords of these resources are different (French literature, transversal approaches). If we know *a priori* that the resource  $r_1$  is isolated, then not to recommend is better than to recommend with a bad quality of prediction. This useful knowledge ( $r_1$  is isolated), allows to avoid a bad quality of prediction.

To ensure the quality of prediction, we select only the non isolated resources. We use a clustering method to determine isolated resources. We have to remind that isolated resources could be considered as noise for most of the clustering algorithms. Then we decide to use a dynamic clustering method allowing creating and removing clusters during the learning phase, such as I2GNG. The I2GNG algorithm analyses data and then builds accordingly the neural network (in defining its structure and its weights), which will be exploited by the recommender and updated iteratively. The I2GNG recommendation consists in answering an *a priori* question; *is the target resource isolated?* yes/no. If yes, no recommendation will be given. Otherwise, nearest similar resources, which belong to the cluster provided by I2GNG, will be recommended.

## Formalization of Pedagogical Resources

A clustering of the pedagogical resources of the UOH dataset will be done using the SupLOMfr indexing. The dataset,  $ds$ , is a set of resources  $ds = \{r_1, \dots, r_k\}$ . After filtering noise in the description of a resource, by removing stop words, the pedagogical resource  $r_i$  is defined as a vector of maps between significant description words and their tf-idf (term frequency-inverse document frequency).

$$\vec{r}_i = [\text{map}_1, \dots, \text{map}_k] \quad (1)$$

Where,  $\text{map}_i = (\text{word}, \text{tf-idf})$ ,  $k$  the is variable size of resource  $\vec{r}_i$ , and  $\text{tf-idf} = \text{tf} * \text{idf}$ .

$\text{tf}$ : the term frequency,  $\text{tf} = \frac{|\{d_j: t_i \in d_j\}|}{|D|}$ , where  $|D|$  is the total number of words in the description  $d_j$ , and  $|\{d_j: t_i \in d_j\}|$  the repetition number of word  $t_i$  in  $d_j$ .  $\text{Idf}$  is the inverse document frequency  $\text{idf} = \frac{\log(|D|)}{|\{d_j: t_i \in d_j\}|}$ .

## Learning Function of Clustering

I2GNG is a neural approach. The learning process of a neural approach consists in defining a mathematical function  $h$ , which affiliates any resource from  $ds$  to its class  $c_j$ . Clustering

pedagogical resources consists in defining the cluster (presented as a neuron)  $c_j$ , the resources that belong to  $c_j$ , and the weight  $n.\vec{w}$  of  $c_j$ .

A cluster (or neuron) contains several resources. The neuron weight represents the center of the cluster, *i.e.* it indicates the average description of all resources belonging to the cluster. Therefore, the vector size of a neuron weight evolves over time according to the learning set of resources. The size  $m$  of a neuron weight is greater than or equal to the size  $n$  of the vector coding a resource ( $m \geq n$ ).

Let  $\vec{r}_a$  be a resource and  $n.\vec{w}$  be a neuron weight of the cluster of the resource,  $\vec{r}_a \in R^n$ ,  $n.\vec{w} \in R^m$ , with  $m \geq n$ . The learning function is  $h: R^n * R^m \rightarrow R$ , where  $h(\vec{r}_a, n.\vec{w})$  is the estimation of the membership relevance of the resource  $\vec{r}_a$  to the cluster of the neuron  $n$ . Typically,  $h(\vec{r}_a, n.\vec{w}) \in [0,1]$ . The resources to recommend if the last viewed resources is  $r_a$  should be all the resources from the cluster with the neuron weight:

$$n.w_a = \underset{n.\vec{w}}{\operatorname{argmax}} [h(\vec{r}_a, n.\vec{w})] \quad (2)$$

### Adjusted I2GNG Algorithm

Neural approaches are computational models inspired by an animal's central nervous system (the brain) which is capable of machine learning as well as pattern recognition. The unsupervised neural I2GNG [6] is an incremental clustering method. The structure of the resulting neural network refers fully to the learning dataset  $ds$ , *i.e.*, the structure of the neural network will not be constrained by any initial condition. Clusters are created and removed dynamically, according to the learning dataset, without any degradation of the neural structure. The dynamicity of I2GNG allows a large tolerance to noise, such as isolated resources, because a cluster created from noise, will be detected implicitly. Despite these advantages, I2GNG requires to be adjusted to detect the isolated resources.

The input/output of I2GNG are respectively a set of resources  $ds$  (the UOH dataset) and a set of clusters (defined as a neural network). A cluster will be represented by a neuron, which at time of creation is considered as an embryo ( $age=0$ ). For each added resource to the cluster, its age will be incremented, until attaining the mature age of the neuron. Each neuron  $n_j$  takes into account the characteristics of its resources, and is described by its weight ( $n_j.\vec{w}$ ).

Let  $\vec{r}_i$  be a vector representing a pedagogical resource, where  $\vec{r}_i \in ds$ . The winner neuron  $n_1$  corresponds to the nearest neuron of the resource  $r_i$ , according to the cosine similarity (*cosineSim*), which is computed from the resource  $r_i$  and the set of neurons weights  $n_j.\vec{w}$ . We note  $n_m$  the neighbour neuron of  $n_1$ , *i.e.* a connection between  $n_1$  and  $n_m$  exists.

In order to set the algorithm according to the context, we fix several parameters related to neural network elements (neuron and connection). The I2GNG parameters are: the mature age of the neuron  $n_j$  ( $n_j.a_{mature}$ ), the max age of connection  $c_i$  ( $c_i.a_{max}$ ), the adaptation

rate of a winner neuron ( $\epsilon_b$ ), the adaptation rate of winner neighbours ( $\epsilon_m$ ), and the neuron threshold  $n_j \cdot \theta$ , which must be respected by resources belonging to  $n_j$ :  $n_j \cdot \theta = m_{n_j} + \alpha \sigma_{n_j}$ , where,  $m_{n_j}$  is the average similarity of resources that belong to the cluster of neuron  $n_j$ ,  $\sigma_{n_j}$  is the standard deviation of similarities, and  $\alpha$  is a fixed parameter. We add a Boolean parameter  $n.unitary$ , which allows defining the isolated resources. If  $n.unitary=true$ , then the resource belonging to  $n$  will be isolated.

To build the neural network, the algorithm begins in checking if the input vector  $\vec{r}_i$  does not match any weight of an existing neuron. If so, a new neuron will be created. When a neuron  $n_{new}$  is created, it will be affected to the embryo set of neurons, with an age equal to 0.

Initially, the neurons set are empty and, for each iteration, the winner neuron  $n_1$  will be selected. If  $n_1$  does not exist or if the similarity between  $n_1$  and  $\vec{r}_i$  does not exceed the threshold  $n_1 \cdot \theta$ , a new neuron will be created with  $n_{new} \cdot \vec{w} = \vec{r}_i$ .

When the winner neuron  $n_1$  does not satisfy the condition, we look for the second nearest neuron  $n_2$ . If  $n_2$  does not exist or if the similarity between  $n_2$  and  $\vec{r}_i$  does not exceed the threshold  $n_2 \cdot \theta$ , a new neuron  $n_{new}$  and a connection between this neuron and  $n_1$  will be created.

When the two neurons  $n_1$  and  $n_2$  satisfy the condition, a neuron  $n_{new}$  will not be created and the neuron weights of  $n_1$  and  $n_m$  will be adapted, based respectively on  $\epsilon_b$  and  $\epsilon_m$ . Then, the age of the connection emanating from  $n_1$  will be incremented in order to give more importance to  $n_1$  versus its neighbours neurons. We add a connection between  $n_1$  and  $n_2$ , if no. Otherwise, if a connection exists, the algorithm modifies the age of the connection to 0 to get importance to  $n_2$  because it is the nearest cluster to  $\vec{r}_i$ .

A connection between two neurons means they are close. All connections with an age that exceeds  $a_{max}$  will be deleted, because this means that the departure neuron of connection has been solicited much more than his neighbouring neurons. Therefore we check the relevance of neighbouring neurons (destination neuron of connection). If the deletion of connection results in an isolation of a neuron  $n_{isolated}$ , this latter will be deleted if it satisfies the condition, where the threshold  $[n_{isolated} + n_3] \cdot \theta = \beta * (n_{isolated} \cdot \theta + n_3 \cdot \theta)$ , and  $\beta$  is a fixed parameter. This threshold represents the acceptable similarity between the isolated neuron  $n_{isolated}$  and its nearest neuron  $n_3$ . As the neural network evolves according to the new data, this condition allows avoiding degradation of the neural network structure. Then, the age of all neurons connected to  $n_1$  will be incremented, and all embryo neurons whose age exceeds  $a_{mature}$  become mature neurons.

We adjust I2GNG algorithm because it builds (creates and removes) dynamically the clusters, in modifying the neuron weight  $n \cdot \vec{w}$ , then the resources positioned at the border of the cluster may be similar to a resource belonging to the nearest cluster(s). This limit can generate a false

isolation of resources. Therefore, we validate the isolation of a resource, which is alone in its cluster. To do this, we compare the cosine similarity with its nearest resource  $r_i \cdot \vec{w}$  and the threshold  $\tau \cdot \theta$ .

## Experimentations and Results

We use the UOH dataset to test our algorithm. The UOH dataset is made of 1,294 resources. We use 70% of the dataset (910 resources) to learn our model and the remaining 30% (324 resources) will be used for the test. Our experimentation consists in analyzing the structure of the resulting neural network, in discussing the scarcity of resources and the evolution of the neural network between learning and validation steps.

### Learning Step

The resulting neural network is decomposed into 152 connections and 583 neurones. The number of connections reveals that 152 clusters among the 583 (*i.e.* 26% of clusters) are close in term of similarity and can be merged in the future.

62.97% of treated dataset are divided into 131 clusters, where the average size is equal to 3.49 and the deviation is equal to 2.70. (37.03%) of treated dataset are alone in their cluster (isolated), *i.e.* there are 452 clusters having only one resource. It means the nearest neighbour of 37.03% of resources can be dissimilar.

### Validation Step

30% of resources are used to test the resulting neural network of the learning step, where the resources will be affiliated to the nearest neurone. The resources belonging to the affiliated neurone will be presented to the user as a list of recommendations and sorted according to their similarity with the tested resources. We observe that 33.87% of OERs from the validation dataset are considered as new, *i.e.*, they do not match a cluster (it does not exist any similar resource from the treated dataset). 66.13% of validation dataset matches an existing clusters, *i.e.* they will be affiliated to their cluster. The resource(s) already into this cluster build the recommendations list.

Now, we observe the similarity  $s$ , between the last visited resource by a user and the first resource of the recommendations list. The similarities  $s \in [0.57, 0.99]$ , it means that 66.31% of resources will have good quality of prediction, and the rest has no recommendations list.

After validation step, 100% of UOH dataset is treated, and then the neural network was improved. To check the improvement of neural network and check if this improvement reduces the isolated resources, we observe the new structure of neural network. The number of connections and neurones becomes respectively 227 and 769.

The number of connections means that 39% of clusters can be merged in the future. However, 36.78 of the UOH dataset are alone in their cluster. It means that percentage of isolated

resources is reduced by 0.25 % comparing to the first step. And 63.22% of the rest are divided into 187 clusters, where the average size is equal to 3.80 and the deviation is equal to 3.24.

## **Conclusion**

In an e-learning context, we have to ensure the capability of making accurate predictions, particularly in open education with anonymous users. The accurate prediction can be affected seriously by the sparsity of resources. To tackle this problem, we adapt the I2GNG algorithm to determine isolated resources and to discover knowledge about resources. As we exploit resources indexed with the standard SupLOMfr, our approach is adaptable to any pedagogical resources.

Based on our experimentation, 36.78% of UOH resources are isolated, this percentage corresponds to the probability of resources for which it is better not to recommend. The results of I2GNG give an important information for UOH management to improve their system, in showing isolated resources and their distribution.

Since our approach of recommendation detects the isolated resources, then we will have accurate predictions. We observe that 39 % of clusters can be merged in nearest future.

As a perspective, the proposed method of recommendation can be extended to consider:

1. the history of consulted resources of anonymous users (Bonnin, 2010), in taking into account: accuracy of prediction, speed of recommendation, and adaptability,
2. the group recommendation, which the case of Academic learning. This use case requires a hybrid of collaborative filtering techniques, and cluster-based recommendation.

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## DEVELOPING 21ST CENTURY SKILLS THROUGH COLEARNING WITH OER AND SOCIAL NETWORKS

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### Introduction

In little over a decade, Open Educational Resources (OER) have opened up access to knowledge through hundreds of projects and open content repositories, open practices and, more recently, Massive Online Open Courses (MOOC). However, OER lie at the heart of the Open Education movement, which advocates that communities and individuals should have access not only to repositories, but also to open technologies and methodologies. Since 2006, innovative OER initiatives such as OpenLearn (McAndrew et al., 2009) have been providing both open content and knowledge media environments (e.g. LabSpace by OpenLearn) for users to create their own open resources, courses and practices. Currently, it is possible to observe that an increasing number of open learning projects has been moving beyond the provision of repositories to offer social personalised platforms for collaborative open knowledge construction. These initiatives (e.g. OpenScout, 2010; weSPOT, 2013) offer opportunities for users to organise their social networks and co-create resources, courses, methodologies, inquiries and best practices.

The aim of this paper is to discuss the potential of online collaborative learning to support the development of 21st century skills. It draws upon an on-going virtual ethnography that aims to investigate colearning – collaborative open learning – with Open Educational Resources (OER) and social networks. The research focuses on COLEARN, an open research network constituted by communities of educators, students and researchers who have been participating in various OER projects, including OpenLearn (2006-2009) (Lane, 2012), OpenScout (2010-2012) (Okada, 2014) and weSPOT(2013-2015) (Mikroyannidis et al., 2012). A large data set that has been collected in the course of activities revolving around the creation of the book *Open Educational Resources and Social Networks* (Okada, 2013) is currently being treated. This project has been conducted for over four years and includes a variety of open digital data from multifaceted social settings in different platforms used during the co-authoring process of three editions of the book.

The process has involved 113 educators, students and researchers from thirty research groups in 21 different universities and 5 countries, who co-authored, initially, 30 chapters that draw upon their mainstream research. Each chapter was specifically designed to make it more

reusable and understandable for a broader target audience. Amongst the activities developed, 7 open web conferences were organised with research groups responsible for each chapter, who discussed their work with readers on Facebook and FM webconference application. COLEARN's fieldwork includes both quantitative and qualitative sources. Thus, a variety of open digital data were co-produced from multifaceted social settings in different project platforms, such as digital productions, discussion forums, wikipage reflections, videoclips about the process, web-videoconferences, virtual focus groups, social media comments, social network dialogue and online surveys.

## **Colearning and 21st century skills**

The term colearning in the digital age (Okada, 2013) is grounded on Freire's principles (1987) and originally cited by Smith (1987) in the book "Joining the Literacy Club". The concept was used to emphasize the importance of changing the role of, respectively, teachers and students from dispensers and receptacles of knowledge to both colearners – collaborative partners on the process of sensemaking, understanding and creating knowledge together. Colearning contributes toward student-centred learning (Brantmeier, 2005) through a more genuine 'community of practice' (Wenger, 1998) grounded on dynamic and participatory engagement for the collective construction of knowledge.

The concept has recently become more popular due to the rapid advances of Web 2.0, which allows the creation and exchange of user-generated content, information sharing, interoperability, user-centred design and social networking. Learning platforms have been changing to social networks and personalised environments with more interactive interfaces such as: social media, blogs, wikis, RSS feeders, webconferences, mapping tools, learning analytics and mobile applications. The rapid advances of digital technologies and Open Education have been contributing to enrich collaborative open learning by allowing colearners to recreate, readapt remix, revise and redistribute their OER in their social networks. Students and educators have been playing important roles as colearners, such as social network managers, new technologies practitioners, co-investigators, co-authors, co-evaluators and peer reviewers (Okada, 2013).

All these roles played by colearners create new opportunities for them to practice and develop their key skills for the 21st century and digital age. Recent studies (Okada et al, 2014; Correa et al., 2014; Calonego et al., 2014) based on the "C" Model (see session 4) developed by colearners – educators, students and researchers (Okada, 2014) highlight seven key skills:

- **Entrepreneurs:** being able to plan their learning, goals and self-management;
- **Technical:** being able to use new technologies, various platforms and interfaces;
- **Proactive:** being able to share different types of information, through a diversity of networks;
- **Interactive:** being able to manage their networks as well as actions and interactions in different levels;

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- Reflexive: being able to elaborate critical and creative thinking both individually and collectively;
- Scientific: being able to develop research, productions and products through scientific methods;
- Innovative: being able to create new practices and influence derived work.

### The COLEARN network

COLEARN is an international community of educators, students and research groups engaged in the use of technologies for collaborative open learning as well as for co-authorship. Grounded on colearning approach, in which students and educators are all collaborative learners and knowledge builders, COLEARN's participants started their research projects in Brazil in 2001, in the Institute led by Paulo Freire. Our aim was to foster studies on educational uses of technology based on emancipatory education. This community has grown into an open research network including a flexible number of groups and communities in Brazil, the UK, Portugal and Spain. CoLearn's interactions and productions have been most significant in three projects (Table 1), which supported the network to co-author three editions of the book "Open Educational Resources and Social Networks" ([oer.kmi.open.ac.uk](http://oer.kmi.open.ac.uk)):

- **OpenLearn** is a large scale online environment supported by Hewlett Foundation with the aim to provide UKOU OER as well as a LabSpace platform and tools for any users to create OER;
- **OpenScout**, supported by the EU, is a social platform focused on "skill based scouting of open user-generated and community-improved content for management education and training";
- **weSPOT**, also funded by the EU, is a working environment with social, personal and open technologies for colearners to build their own inquiry-based learning space.

Table 1: Colearn – practices, projects and productions during International OER projects

Projects	weSPOT (2013-2015).	OpenScout (2010-2012)	OpenLearn (2006-2009)
Environment	Open massive environment for recreating, reusing, remixing and redistributing inquiry as OER	Social Network platform for recreating, reusing, remixing and redistributing research as OER	LMS for recreating, reusing, remixing and redistributing OER
Platform	Elgg, social media, Widgets, learning analytics, mobile interface, sensor data collection openbadges	Elgg, Wordpress & social media (Facebook, Twitter, Youtube, Wikimedia)	Moodle with FM web conference application and Compendium mapping tool
Colearn Participants	2013 – 25 co-investigators	2010 – 200 colearners 2011 – 113 coauthors 2013 – 9,526 visitors p/month	2006 – 50 users 2013 – 3500 members
Colearn Profile	Coordinators, postgraduates, undergraduates, researchers, lecturers and supervisors	Research groups, supervisors, lecturers, research students and OER designers	Online course authors, learning designers, educators and HE students
Colearn Coauthorship	Period of 6 Months 14 inquiry projects, 80 skills mapped, 150 literature papers reviewed, 6 papers, 10 events, 4 videos, 1 ebook	Period of 1 and a half years 48 tools details/ 84 images 20 videos, 100 maps, 20 chapters, 1 e-book, 2 books, 12 conference presentations	Period of 3 years 30 papers, 90 maps 70 webconferences 15 OER – LabSpace units, 10 Colearn Journal papers
Colearn Collaboration	Collaborative action research, coinquiry, learning analytics, network analysis with gephi, nodeXL and TouchGraph	Collaborative research for developing chapters, tool descriptions, peer review and OER production	Collaborative discussions, content design, forum facilitation and activity support

Table 1 summarises COLEARN’s practices, projects and productions during three International OER projects. It also shows the different numbers of colearners participants engaged in 3 these projects, their increasing productions (coauthorships) and opportunities for collaborations during a decreasing period of time. Information about Colearn coauthorship as also considered in the data analysis.

## **Methodology**

This qualitative research based on virtual ethnography focuses on the process of colearning during the production of the book “Open Educational Resources (OER) and social networks”. This book started with a key research question, which was discussed during the whole writing process: How can we, as academic researchers, make our work more accessible and reusable for any interested reader to recreate and innovate it? In other words, how can readers become co-authors?

A hundred and thirteen coauthors from thirty research groups of different universities and countries co-authored thirty-three chapters that draw upon their mainstream research and redesigned the content to make it more reusable and understandable for a broader target audience. Some groups reused their best scientific papers, which were already presented in peer-reviewed conferences and journals, or that were available in their academic repositories and readapted them under a three-stage review process.

The majority of the co-authors, who are leaders of research groups in their institutions, invited colleagues, students, lecturers and researchers to provide feedback. In some groups, the most active readers were invited to participate in the chapter rewriting it by adding new media components such as images, video clips, and knowledge maps, glossary, learning objectives and activities, key questions, social media for further discussions as well as suggestions of how other readers might be able to reuse the content.

The role of students, postgraduates and undergraduates as co-authors has been pivotal, and their contribution has been varied, ranging from technical support for the use of technology to create media components, to establishing connections between content and tools as well as participation in discussions that helped to reshape the material for the intended audience as well as increasing its reusability.

This book was created under the auspices of the European OpenScout project. The second and third editions were extended with new chapters including one that was developed in the weSPOT environment, which describes the “C” Model for analyzing competences for colearning and co-inquiry in the digital age (Okada et al., 2014). The first draft of “C” model was created with the collaboration of 70 members from the 21st century Education event organized by Telefonica Foundation in a massive open environment. This model was improved by a group of 25 people who registered in weSPOT platform to create some collective inquiries to apply this model in different case studies.

Figure 1 shows this “C” model applied to analyse the colearning process in the coauthoring of the book. This open visualization can be accessed online through the map view “C” model applied to the OER book production.<sup>1</sup>

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<sup>1</sup> To visualise the map, go to

<http://labspace.open.ac.uk/blocks/compendium/browsemaps.php?context=&id=1456>

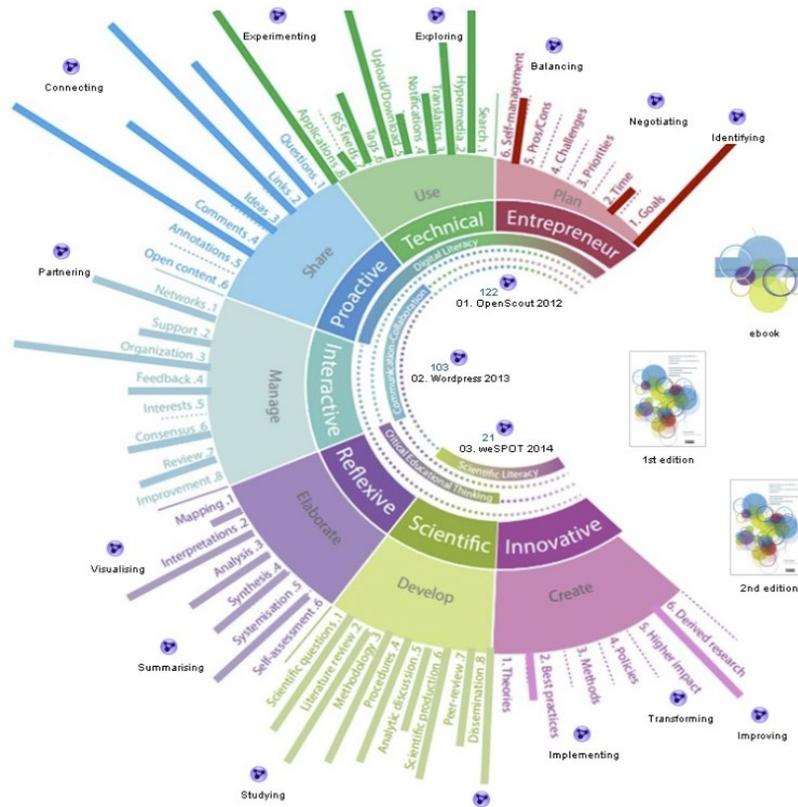


Figure 1. “C” Model Visual analytics for analysing key competences for colearning and co-inquiry

The research fieldwork comprises a large variety of both qualitative and quantitative sources within the three projects platforms as described in Table 1. These data comprises digital productions, discussion forums, wikipage reflections, videoclips about the process, web-videoconferences, virtual focus groups, social media comments, social network dialogue and online surveys.

Thus, the data presented in Figure 1 shows evidence of 11 skills that emerged as the most significant ones in the network of colearners–coauthors of the book. Therefore, online collaborative learning potentially supported the development of the following key skills:

- identify individual and collective goals,
- negotiate time, challenges and deadlines,
- balance self-management and group self-management,
- explore hypermedia, translators and notifications,
- experiment new applications,
- connect and share new ideas and connected comments,
- partner and expand their network interactions,
- visualize and create visualizations,
- study and review literature,
- expand dissemination events,
- implement best practices,
- transform their own practice,

- improve ongoing colearning through derived work.

## **Discussion and Key Findings**

The “C” model infographic was developed based on the surveys and notes developed during the process. The icons in the map show the qualitative content analysis and interpretation of the most significant data from the perspective of the users and community. From both analyses, it is possible to summarize seven groups of skills described below:

1. **PLAN:** goals, time and self-management.  
Data in the C model shows that all the contributions and interactions were based on voluntary participation. Groups and all participants had to plan common objectives and other requirements to achieve their expected and unexpected outcomes during the process.
2. **USE:** various tools – search engines, hypermedia, translators, notifications, upload/download, tags, RSS feeds and applications.  
Data in the “C” model shows that all co-authors registered in the OpenScout Tool Library and used the platform, some of them contributed by sharing, searching and aggregating content as well as their best practices with the platform.
3. **SHARE:** questions, links, ideas, comments, annotations and open content.  
Data in the “C” model shows that participants who were interested in contributing to the OER book design, reusability as well as OER peer-review, had opportunities to be more active by sharing a diversity of files, messages and wiki pages in the platform.
4. **MANAGE:** networks, support, organisation, feedback, interests, consensus, review and improvement.  
Data in the “C” model shows that participants who were leading the content of the chapter and were the main editors, had opportunity to manage all contributions. This was also extended to the leader assistant who was supporting management tasks.
5. **ELABORATE:** mapping, interpretations, analysis, synthesis, systematisation and self-assessment.  
Data in the “C” model shows that each chapter was designed based on an OER design template which included interactive and multimedia components whose content was outcome of a creative and reflective process of elaboration.
6. **DEVELOP:** scientific questions, literature review, methodology, procedure, analytic discussion, scientific production, peer-review and dissemination.  
Data in the “C” model shows that various research groups had opportunity to improve their research content through a scientific framework and interfaces offered by the projects’ platform.
7. **CREATE:** theories, best practices, methodologies, policies, higher impact, derived research.  
Data in the “C” model shows that some research groups had opportunity and interests in disseminating and exploiting their research work. This included obtaining more

feedback from their communities, enriching their curriculum with the materials, creating new publications as derived work as well as proposals for new research funding.

## Final remarks and Future work

This study shows a group of skills that emerged in the COLEARN network during the production of the book “OER and Social Networks”. The coauthoring process which was based on colearning approach with OER and social networks, contributed to increase opportunities for different groups of colearners to develop a different group of skills based on their interests, actions and knowledge developed during the process.

A global overview of individuals’ and groups’ skills were integrated to show the COLEARN network’ skills. The instrument for analysis applied in this research was the “C” model analysis created by the community itself for identifying and representing these skills. The data analysis developed by the authors was shared with all colearners members who contributed to the book production in different stages. Our next step is to obtain the community feedback about this research and findings.

The limitation of this research has currently been discussed with colearners participants in order to get deeper analysis with more data and subject’s different interpretations. The study on skills for 21st century learning may be of great importance to the development of new skills such as critical-creative thinking, communication and collaboration as well as scientific literacy through collaborative inquiry-based learning. Educators play an essential role in supporting students to build better information search strategies. Additionally, working environments with social personal open technologies such as weSPOT might be useful for educators and colearners to develop investigations on individual and collective issues, conduct efficient searches on the web, and construct knowledge collaboratively.

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## **PROMOTING ENGAGEMENT IN MOOCS THROUGH SOCIAL COLLABORATION: COMMON LESSONS FROM THE PEDAGOGICAL MODELS OF UNIVERSIDAD GALILEO AND UNIVERSIDADE ABERTA**

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### **Introduction**

Massive open online courses (MOOC) have been dramatically expanding online learning opportunities due to the emergence of new platforms and MOOC aggregators that facilitate access and search for courses according to the needs of each user, growing from a selection of specialist courses to an offering of hundreds of courses on major online platforms with millions of registered users (Jordan, 2014). All this has caused a very interesting debate about their influence in the future of higher education.

Initially, MOOCs were seen as a form of providing better education for all, offering the opportunity to study with the best teachers for free and promoting the development and management of specific learning communities for people with less access to education. However, different studies show that people who enrol and participate in a MOOC generally have higher education qualifications. Koller (Koller & Ng, 2013) indicates that 43% of students have an undergraduate level, 37% a master's level and 5.4% a PhD level. In another study by the University of Pennsylvania (Emanuel, 2013), students with a higher education qualification dominate again, at 83.0%. Of these, 44.2% have a post-graduate level. Data from the Telescope project, the first and currently only Latin American MOOC platform (Hernández Rizzardini et al., 2013a; 2013b) shows that 18% of its students are from pre-university level, 38% are undergraduates and 44% have a bachelor's or a master's degree.

Another strong criticism of MOOCs comes from their high rate of attrition, even if it may be seen with a positive connotation (Kizilcec et al., 2013; Pardos et al., 2013; Veeramachaneni et al., 2013), because the millions of students enrolled in the same course have different training needs and motivations. A recent study of participants from three different MOOCs at Stanford (Kizilcec et al., 2013) evidenced that the main reasons for enrolling in a course are having fun, meeting challenges and an interest in the subject matter. Hill (2013) characterizes the different patterns of student behaviour in four groups: observers, dropouts, passive and active participants.

On the other hand, MOOC's are considered open access, which means anyone can register and participate. They have a defined structure, but this structure must support and be helpful to thousands of people with different learning styles, accustomed to different forms, techniques and methods of learning, coming from different countries and cultures, having different customs and interests. It is also important to recognize that students may face problems of isolation and disconnection in the virtual learning environments used in the courses (Siemens, 2012). Learning online requires some autonomy and organization skills, and students may not be able to self-organize their work for various reasons, including not being used to control their own learning, or face difficulties to complete activities caused by the lack of validation and support from their mentors. All these factors are generally pointed out as the main contributors to the high dropout rate characteristic of MOOCs (Hernández, 2007). However, all the studies about this issue have not considered the analysis of the learning experience designed. It is evident that the traditional model of education does not adapt well to this type of courses.

Given these concerns, we have initiated a research collaboration between the Galileo University in Guatemala and the Open University of Portugal on issues of design and development of an educational model based on the use of learning artifacts, using cloud based tools to improve learning experience and achieve better results. This paper describes the main characteristics of the traditional teaching model of a MOOC, the general aspects of content delivery, learning activities, evaluation methods and communication. The rest of the paper is organized as follows: Section 2 presents a critical view on the traditional teaching model of a MOOC; Sections 3 and 4 describe previous experiences at the Open University of Portugal and Galileo University, depicting their respective Pedagogical Models for MOOCs, as well as the results of pilot testing; and Section 6 focuses on conclusions and future work.

## **Dominant Pedagogical Approaches in MOOCs**

The acronym MOOC was coined in 2008 by Dave Cormier and Bryan Alexander while collaborating in the first MOOC, labelled "Connectivism and Connective Knowledge" (CCK08), which was organized by George Siemens and Stephen Downes (Siemens, 2012). The course was formally offered to 25 paying students from the University of Manitoba and informally to about 2,200 students from around the world (Downes, 2012; Daniel, 2012; Watters, 2012), and it was an experiment in the application of Connectivism and networked learning, a modern alternative to classic learning theories (behaviourism, cognitivism, constructivism). Because of this "connectivist" approach on which it is based, this type of courses became known as cMOOCs. On the other hand, xMOOC respond to a more traditional model of teaching, where the teacher is responsible for planning the learning activities and providing all resources necessary for the participant. These courses are based on a behaviourist pedagogy, focused primarily on the transmission of information and the execution of short tasks. Students acquire new knowledge through a series of lessons, mainly composed of short videos supported by PDF documents, combined with formative testing,

automated or peer review. It is important to point out that by using the model described above, it is very difficult to get students to develop higher order skills, such as the ability to think critically (Bloom) – analyze, evaluate, or provide solutions – or inferential and creative thinking, to facilitate knowledge integration and construction, and to develop meaningful learning scenarios.

## **The Experience at the Open University of Portugal**

### ***Building a compromise: The iMOOC Model***

UAb.pt's model for MOOCs builds upon the four main pillars of the university's pedagogical model: learner-centeredness, flexibility, interaction and digital inclusion. There's a combination of autonomous and self-directed learning with a strong social dimension. It also articulates flexibility with the pacing necessary to help students get things done in face of their pressing everyday commitments.

There are elements in all types of MOOCs that are interesting and useful, but none of them fit exactly UAb.pt's pedagogical model. In accordance, UAb.pt's model incorporates elements from existing MOOCs but adds other relevant aspects that derive from our experience with online learning and its integration in the larger context of the institution's pedagogical model, as well as the work that has been done regarding open educational resources and open educational practices. MOOCs in this pedagogical model, following the current terminology, can be labelled iMOOCs, with their focus on individual responsibility, interaction, interpersonal relationships, innovation and inclusion.

In this model, courses are open to everyone who wants to participate. Registration is required for publishing in the institutional spaces but all course contents are accessible to anyone. Learning is learner-centred and based on the realization of activities. Courses start with a "boot camp" module, that can last one or two weeks, meant 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.

Learning should be evidenced through the creation of artifacts (texts, videos, presentations, slidecasts, mind maps, mash-ups, etc.), freely accessible online, that demonstrate the learner's knowledge and competencies regarding the material studied. The learning process combines autonomous self-study and reflection with interaction with other participants in an open social context. Participants are expected to take an active role in and be responsible for their own learning, but also to actively engage in helping build a supporting learning community.

Learning support rests in the learning community, through collaboration, dialogue, peer feedback and active engagement from participants in the learning process. Resources provided as a starting point for the realization of the activities are licensed as Open Educational Resources or freely available on the Internet. Formative assessment can take the form of self-

correction tests and also of peer feedback regarding the artifacts produced in the learning activities.

Although there is a central place for the course (website, wiki, blog, LMS, etc.), where all relevant information is provided (content, resources, schedule, instructions, etc.), most of the work and interaction should benefit from a networked learning perspective, whereby students use their own personal learning environments to manage their learning, publish their artifacts and engage in the conversation with other participants. A small team of collaborators can be used to support the implementation of UAb.pt's iMOOCs – gather relevant information to be used to monitor and perfect the ongoing process, serve as community facilitators, monitor social or information networks for course related content, elaborate weekly summaries, etc.

### ***The importance of facilitating the transition***

As stated above, a critical element of the Model is its contribution to facilitate the transition from non-formal education to formal education through certification. This is majorly played by the way certification options are embedded in the courses.

In the iMOOC Model, graded assessments are included for participants who want to receive a certificate of completion of the course. In this case, at least two of the artifacts 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 artifacts produced by 3 other participants and have their artifact graded by three other participants. The final grade will be the average obtained in the 3 grades given. E-portfolios can also be used for grading purposes where they are considered adequate. The assessment follows the same peer-review procedure. Every assessment will be based on a detailed rubric provided by the professor or professors leading the course.

But, in order to fulfill its purpose of bridging the gap between non-formal education and formal education, the Model also allows for participants who want it or need it to go a step further. Thus, UAb.pt's iMOOCs offer participants the additional option of obtaining formal credits, for a fee, after the completion of the course. Those credits (ECTS) will be awarded following an evaluation by a professor or tutor comprising the two (or more) graded artifacts and an e-portfolio presented by the participants with the most relevant elements of their work in the course. This can be combined with a final, face to face exam when deemed adequate.

### ***Results of pilot testing***

The iMOOC Model was subject to a pilot test run in May 2013. UAb.pt developed a pilot course *Climate Changes: The Context of Life Experience*<sup>1</sup>, following the principles stated above. Moodle (version 2.4) was used to centralize the main information regarding contents, resources, suggested activities, schedule, etc. It also harbored the discussion forums, one of the

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<sup>1</sup> The Course was based on available OER produced in the framework of Lech-e (LECH-e – Lived Experience of Climate Change E-Learning - <http://www.leche.open.ac.uk>), an EU-funded project led by the Open University.

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places where participants could interact and debate on relevant aspects of their learning process. This was integrated with Elgg (version 1.8), an open source social networking platform to be used as an institutionally supported Personal Learning Environment (PLE). The course ran from May, 6 to July, 1st, with a total duration of 8 weeks. The first week was dedicated to the boot camp module. The remaining 7 weeks were divided into 5 topics.

The pilot course attracted 1016 registered participants, of which over two thirds actually started the first learning activities according to the schedule. Access levels were high during the first half – first three to four weeks – of the course, with a regular decrease as the course progressed. This was already expected and confirms a typical phenomenon in this kind of courses.

Also of particular significance was the fact that interactivity levels were untypically high in the first four weeks. According to our interpretation, this phenomenon resulted from the successful introduction of the initial facilitation boot camp module. In fact, this innovation allowed for the community to establish all its basic communication networks and also to build a community spirit and some sort of shared identity even before participants got in touch with the course contents and actual learning activities started.

A high volume and quality of interaction amongst course participants was one of the main features of the iMOOC pilot course run. The total number of wire posts published during the first half exceeded one thousand (1155). Plus, over seven hundred blog posts (717) and four hundred files (410) were also published.

The transition to week 5 in the course brought a sudden and steep break in presence and participation. Despite some attempts to revive the very good dynamics and overall activity levels of the first half – we launched some challenges and did a Google hangout with an expert, among other things – the numbers relative to the second half of the course are significantly lower when compared those of the first half, as shown in the Table 1 below.

Table 1: Number of items published in the social learning environment

<b>Elgg – Number of items published – first 4 weeks</b>			
<b>Wire posts</b>	<b>Blog posts</b>	<b>Favourites</b>	<b>Files</b>
1155	717	431	410
<b>Number of items published by course end (8 weeks)</b>			
1497	952	506	487

We cannot say that we have hard data to account for and explain this sudden change, but we identified some aspects that we think may have been responsible for this:

1. This fifth week coincided with the final school year week in our secondary schools, and an important part of participants were teachers. This is an extremely busy week, followed by another with assessment meetings, and many participants may have felt

overwhelmed and incapable of juggling this kind of responsibility and workload with the participation in a free course.

2. It was the week of the first graded artifact, through a peer-assessment process, for those who wanted to get a certificate of completion. Although the peer-assessment process was mandatory only for these participants, it may have helped increase stress levels and the last drop like perception, especially among participants who were already struggling with managing their time, that they couldn't keep up with the course, leading them to quit.
3. People can only maintain the extra-level of effort and workload that a course adds to their daily professional and personal life for a given period of time. After that, it becomes increasingly difficult to keep up, especially in the case of a free course that, because it has less "hard" incentives than a formal, paid course, can drop very quickly in the list of priorities and be dismissed in face of the mounting pressure or unexpected trouble (work emergencies, family health, etc.).

That is why, as a result of the experimentation phase, the typical duration of courses in the iMOOC model was decreased to six weeks. Furthermore, we are considering the relevance of having graded, peer-assessed artifacts in all courses, or only in those where that is deemed very important, using peer-assessed eportfolios instead in the other courses for the certificate of completion. Finally, and this is not always possible or feasible, we think more attention needs to be paid to the course schedule, avoiding specific times of the year that may be obviously busy or difficult for a big part of the expected participants.

102 participants answered the final questionnaire, describing their participation as follows: participated throughout the whole course (39%); was a peripheral participant, following the activity but not engaging (much) in the interaction or the tasks (33%); started the course but had to quit after a while (22%); registered for the course, but never accessed it (7%).

The main reasons for not participating much, quitting the course or not accessing it at all were lack of time and unexpected, force majeure circumstances, as shown in the Table 2 below.

Table 2: Low participation, drop out or not take part in the course

	<b>Peripheral participation</b>	<b>Drop out</b>	<b>Never accessed</b>
Lack of time	60%	33%	33%
Unexpected circum.	----	23%	56%

Overall, the levels of satisfaction expressed in the answers to the questionnaire were very high. Of a total of 94 respondents to this question, 90% said that they would recommend the course to other people, and 84% would take another iMOOC course, if they had the chance. When asked to evaluate the overall quality of the course, 38% of the 95 participants who answered this question rated it as excellent, while 45% rated it as good. 54% of 95 respondents totally agreed that the "boot camp" week had been an essential phase in the course, and 37% agreed with this statement.

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Questions related to the course content and objectives were also very positively valued. When presented with the statement “The course contributed to change my personal attitudes regarding environmental issues”, 35% of 95 respondents totally agreed, while 41% agreed. As for “After this course, I believe that the consequences of climate change are an inescapable reality”, 54% totally agreed and 32% agreed.

The pedagogical support and methodologies throughout the course were very well rated. The Learning Guide was considered very useful in scaffolding and supporting learning (totally agree, 43%; agree 53%); the detailed instructions for the tasks were clear (totally agree, 63%; agree, 30%); the suggested activities were interesting (totally agree, 38%; agree, 60%); and the learning support was adequate (totally agree, 48%; agree, 43%). Finally, the learning environment was considered good (42%) or very good (36%).

## **The Experience at the Galileo University**

### ***Building up from the x-MOOC approach***

Motivated by our previous experience in implementing a massive virtual course related to “Producing Webpages” (Hernández et al., 2007), we started in 2012 our first two MOOCs, “iPhone Development” and “Introduction to e-Learning” (Hernández Rizzardini et al., 2013a). We based these courses on the xMOOC model, which is more close to traditional virtual education, and were able to, through our previous experience in the field, adapt resources and means in a natural way. Both MOOCs were implemented in the .LRN (Hernández Rizzardini et al., 2013a) platform, with the development of several adaptations and improvements to meet our needs. OSQA (Open Source Questions and Answers System) was integrated with the system to handle the massive posting and a gamification approach was used (Siemens, 2012), giving users badges to highlight the main contributions, the more active users and the “hottest” questions in the forums. Furthermore, the method of evaluation of our native platform was adapted to permit peer-assessment. Each learning activity was accompanied by an assessment rubric and students used it to evaluate their peers. If a student was assessed on more than one occasion, the platform calculated an average final score from the different assignments. Additionally we used the same tools that the platform provides for traditional virtual education.

The MOOCs were structured in learning units, typically distributed per week. Each unit had between 8 to 10 short videos, with an average duration of 8 to 10 minutes, accompanied by an activity and assessment associated with each topic. All learning activities were designed with the support of a range of cloud-based tools to foster in students the development of skills and knowledge required in real life scenarios (Hernández et al., 2014). Each MOOC began with an introductory week, where the general aspects and the methodology of the course were described, in order to familiarize students with the learning environment and the overall course structure, concepts, performance, assignment types, media and evaluation methods.

Each learning unit had a set of learning objectives and learning activities and students must complete a series of tasks that led to the completion of a final project.

Although initially based on an xMOOC approach, our model proposes several strategies that seek to promote a more rewarding and meaningful learning experience and to improve outcomes. Moreover, it adds design components which are not present in xMOOCs, such as the Boot Camp, the strong social dimension that aims to create learning communities and the production of learning artifacts using cloud based-tools. Each of these components will be described in the next section.

### **Result of pilot testing**

The experiences presented correspond to the “Community Manager” MOOC, implemented during May 2014 with more than 9,000 enrolled students from over 20 countries. The majority of the participants were based in Spain (31%), Guatemala (18%), Colombia (9%), Argentina (8%) and Mexico (6.5%). For 61.5% of the students, this was their first MOOC experience. 57% of the enrolled participants were men and 43% were women, with an average age of  $M=35$  ( $\sigma=11$ ). 35.43% of participants had undergraduate level, 11.74% mastery level and 33.44% were university students. The main objective of the course was to develop the skills to manage brands through social networks such as Facebook or Twitter, for example, and other resources required in competitive situations in today’s market. The results obtained in relation to the participation of the students are summarized in Table 3 below.

Table 3: Implementation of the MOOC

<b>Registered participants</b>	9,138
<b>Students’ Participation:</b>	
<b>a) Did not start the course</b>	5,006 (54.78%)
<b>b) With at least one login</b>	4,132 (45.21%)
<b>c) Watched at least one video</b>	2,148 (51.98%)
<b>d) Delivered the first task</b>	680 (16.45%)
<b>d) Completed the course successfully</b>	324 (7.84%)
<b>Final grades of students who completed the course successfully</b>	$M=80.94$ ( $\sigma=9.87$ )
<b>Forum activities</b>	753 people active in the forum. 1891 questions/8937 answers

All courses begin with a “boot camp” module with the duration of one week, supported by resources and tutorials for participants to become familiar with the Virtual Learning Environment, tools and services to be used, as well as the methodology of work, evaluation methods and the media to be applied in the course. The content developed for the boot camp week was built using Google presentations, with a downloadable pdf format. The study of the 36.73% of participants who successfully completed the “Community Manager” course shows that 82.35% them strongly agreed with the content presented in the boot camp week, pointing out that it allowed them to function in an appropriate manner during the remaining of the course.

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The learning process in this approach combines self-study and self-reflection with interaction with other participants. Our model uses forums as the main tool of mass communication. 72.8% of the respondents who completed the course indicated that the use of forums in the course was useful and enhanced their learning experience. Currently social networks are used as tools of communication and socialization for the “Community Manager” course. On Twitter we use the hashtag #cmtelescopio to encourage participants to share resources of interest on each topic of the course. This hashtag appeared in 1145 tweets, 30% of which were related to concerns about the development of tasks or content presentation, while 34% were useful resources for the participant. An interesting data about using Twitter in this course is the fact that participants resorted to it for a faster response. Another tool used for creating a learning community related to the course was a Facebook group, organized with the aim of resolving general doubts about the course, share resources and support participants. The group had 546 members, who published 294 posts and made 119 comments.

To promote interaction between faculty and participants in real time, we organized two Google Hangout sessions throughout the course, where a summary of the week’s events was presented, followed by a questions and answers period. The average attendance in these sessions was 385 people, and they were subsequently viewed offline by more than 600 people in total.

The purpose of web 2.0 (cloud-based) tools in the “Community Manager” course is for the learning activities to reach the instructional objectives by fostering conceptual demonstration, structured knowledge representation and the completion the assignments. An additional benefit for students is that they learn how to use a set of web 2.0 tools that they can then apply to different contexts (other learning experiences, work situations, etc.). Therefore, the learning should be evidenced through the creation of artifacts (texts, videos, presentations, slidecasts, mind maps, mash-ups, etc), that demonstrate the students’ knowledge and skills in relation to the material studied.

In order for students to develop higher order thinking skills, it is necessary to use learning strategies that foster critical and reflective thinking, creative thinking, and operations at the levels of analysis, evaluation, problem solving and synthesis. Some web 2.0 tools as, for example, Google Docs and MindMeister are proposed, since they seem to support effectively these strategies. 42.6% of the respondents agree that tasks such as making a summary in Google Docs or building a mental map in MindMeister improved their learning process.

The use of these cloud-based tools seems to increase motivation, focus on task, reflection on the learning taking place and to improve the quality of students’ work. 45.59% of the participants indicated that they learned a lot from the course and 49.6% expressed their interest in continuing to learn in this learning environment. 97.4% of the respondents indicated that they would be interested in taking another course in MOOC format in the future.

The MOOC courses from the Galileo University presented in this paper proved to capture learners' satisfaction. They registered a high enrolment rate and in spite of the high drop-out rate, 45.59% of the participants who answered the post-test indicated that they learned a lot from the course. Moreover, 49.6% of those participants expressed their interest in continuing to learn in the online environment used. 97.4% of the respondents indicated that they would be interested in taking another course in MOOC format in the future.

## **Conclusions and Future Work**

As stated in the introduction to this paper, although MOOCs have become a worldwide success, capturing the attention of academia, the media and public in general, they have been subject also to strong criticism based on their high rate of attrition. This is basically an expression of the prevalence of an old and inadequate traditional academic expectation regarding the potential of open education and in particular MOOCs. As the experiences of both the Open University of Portugal and the Galileo University prove, independently of the basic pedagogical approach used, learner satisfaction and, most importantly, the success of the learning experience cannot be measured by completion rates. This cannot be a quality indicator for non formal open forms of education delivery. In fact, participants in MOOCs are typically non homogeneous groups of learners with quite different backgrounds, expectations and ultimately aiming at different learning outcomes.

As the experiences of the institutions presented in this paper also demonstrate, the improvement of the quality of MOOC offering depends on how much more flexible and adjustable to different contexts and needs the learning opportunities provided can become. According to the results of the institutional experiences shown, the real success factor in a MOOC is the level of engagement obtained from course participants. This can be highly improved as compared results show from the use of learning artifacts, as well as cloud based tools.

An additional conclusion points to the fact that independently from the different academic environments, the regional cultural setting or the pedagogical approach characterizing each institutional provider, common learner engagement strategies can be developed and implemented amongst institutional providers. This leads to our future work. In fact, the researchers team at the Open University of Portugal and the Galileo University intend to explore how the common trend identified in this study can lead to the emergence of a hybrid pedagogical model for MOOC design. A model which extends even further the use of cloud-based social media tools by that allowing enriched networked interaction between course participants in massive learning environments.

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## **INTERNAL RESPONSES TO INFORMAL LEARNING DATA: TESTING A RAPID COMMISSIONING APPROACH**

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### **Introduction**

There are several unique aspects to researching the behaviour and motivations of informal learners. Examining informal learning data can allow researchers to respond more quickly, and at a greater scale, than to data gathered through formal institutional research processes. Studies undertaken in 2013 (Law, Perryman & Law, 2013; Perryman, Law & Law, 2013; Law, Perryman & Law, 2014), in collaboration with The Open University's OER Research Hub ([www.oerresearchhub.org](http://www.oerresearchhub.org)) provided a set of recommendations for The Open University (OU) around informal learning. These primarily drove the OU's commissioning approach to scope new content for informal learning channels during 2014 and to improve the usability of OpenLearn – the key platform on which free resources are delivered by the OU ([www.open.edu/openlearn](http://www.open.edu/openlearn)). This paper reports on the impact of research undertaken in 2013 and 2014 into informal learning on the OpenLearn platform and shows how simple research models in the open can bring about change in a short period of time.

### **Background**

#### ***OpenLearn and iTunes U***

OpenLearn ([www.open.edu/openlearn](http://www.open.edu/openlearn)) is the OU's web-based platform for free educational resources and was launched in 2006. It hosts hundreds of online courses and videos and is accessed by over 5 million users a year; most of the resources are available under a Creative Commons licence. It also serves as the medium through which the OU promotes its partnership with the BBC and the related broadcasting and free open access courses and contents that are created as co-productions with them. Since its launch, OpenLearn has received 33.4 million unique visitors (internal OU data) and has developed from being a platform that hosts units from decommissioned undergraduate and postgraduate courses, to one which hosts commissioned interactive games, videos, podcasts and free online courses. Much of the course extract content is developed using structured authoring tools and then made available to users in multiple formats such as Microsoft Word and epub (that can be opened by ebook readers).

The development of OpenLearn was initially funded by the William and Flora Hewlett Foundation in 2006 along with its sister website OpenLearn Works, a platform where NGOs and philanthropically-funded projects can publish, remix and reuse courses targeted to specific populations. With the end of the Hewlett Foundation grant, OpenLearn and OpenLearn Works became mainstream activities for the OU and now form part of one of the University's strategic priorities – 'the Journey from Informal to Formal learning' – as part of The OU's commitment to widening participation. The OU aims that 5% of each of its courses should be made available on OpenLearn in whole, meaningful units, some of which are embellished with interactive quizzes and additional audio visual content.

For the period August 2013 to July 2014, The OU reports a 10.8% click-through rate from OpenLearn to the 'Study at the OU' webpage to learn more about becoming an OU student.

Since 2008, The OU has also made available hundreds of eBooks, courses, audio and video via its channel on iTunes U. Many of the audio and video files are elements of larger projects and courses produced for its fee-paying students, or specifically commissioned to be Open Educational Resources (OER) and shared across several open platforms i.e. OpenLearn and YouTube as well as iTunes U. As an institution specialising in producing higher education (HE) content for distance learners, the aim of this approach is a natural extension of the University's mission to further make available its OER, but also to reach a growing population of mobile device users.

At time of writing, there have been 67.1 million downloads and 8.6 million visitors to The OU on iTunes U. For the period August 2013 to July 2014, The OU reports a 0.8% click-through rate from iTunes U to an OU web domain (OU internal statistics).

### **Studies and recommendations from 2013**

In 2013 a study was undertaken to analyse and compare the demographics of The OU's informal learners, students and educators who are using OpenLearn and/or iTunes U. In addition an analysis was made of what content these three categories of users were using, how they were using it and how using these OER motivated them or otherwise to progress to formal education. The objectives of the study were to:

- Understand as far as possible, how the content provided as OER through the OpenLearn and iTunes U platforms serves the demographic using them, and
- Understand more about how the widespread offering of OER is impacting learners' motivations to take up formal study.

These objectives aligned with two of the OER Research Hub project hypotheses, and hence could form part of the data set collected by that project (see <http://oerresearchhub.org>):

- Open education models lead to more equitable access to education, serving a broader base of learners than traditional education, and

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- Open education acts as a bridge to formal education, and is complementary, not competitive, with it.

In addition to this research activity, pilot projects around digital badging at The OU were undertaken in 2013 on OpenLearn using the Mozilla Open Badge Infrastructure (OBI) (see [openbadges.org](http://openbadges.org)). Digital badges were awarded via three entry-level *Openings* courses (access level): *Learning to Learn* and *Succeed with Maths Parts 1 and 2* for the successful completion of the course and passing of quizzes. The evaluation of these pilots was in alignment with the study of the wider OpenLearn and iTunes U platforms in that it gathered identical demographic data and asked questions about informal learner motivation.

Findings from both studies were reported in (Law, Perryman & Law, 2013; Perryman, Law & Law, 2013; Law, Perryman & Law, 2014) and recommendations were delivered internally to inform the business of informal learning commissioning at The OU. The studies concluded that:

- The two different informal learning platforms were being used by very different demographic groups with different motivations,
- Using OER during formal paid-for study can improve learners' performance and self-reliance,
- Learners' motivation is enhanced through the provision of digital badges,
- University-provided OER acts as a taster before embarking on formal learning,
- The same free content on different platforms can meet the needs of both professional and personal development but that work was needed to improve the learner experience, and
- The badged open courses attracted learners who were more inclined to become students and were key to meeting The OU's widening participation agenda (there were significant variations in relation to prior education, numbers of retired learners and numbers of learners reporting a disability compared to OpenLearn and iTunes U users overall).

Based on these conclusions, the recommendations that were made within The OU were as follows:

4. Create an entire Badged Open Course (BOC) curriculum targeting access students (work to be completed in October 2014, see Law, Perryman and Law, 2014),
5. Improve the usability of OpenLearn especially around the user experience of studying an online, unsupported course, and
6. Extend syndication to reach new audiences.

## Contextualising 2013 data and building on it

Over the last year, a range of methods have been developed that allow organisations and individuals to create and issue digital open badges (Bull, 2014). The rise in such developments is largely in response to the demand to issue badges and the range of achievements that can be

recognised digitally. Bixler and Layng (2013) note that digital badges in higher education ‘hold great promise’ but that ‘policies on badges for higher education institutions do not exist’. This is still largely true although the Badge Alliance (a group of volunteers discussing the potential use of badging for different groups largely based in the US, see <http://badgealliance.org/>), is, amongst other things, taking case studies and innovations from contributors to build a picture for badge use within HE.

This growing interest in soft assessment and badging was also identified by Grant and Shawgo (2013) and highlights that learners want recognition for informal study. This challenges the notion of informal learning described by Cross (2007) as one where “...no one assigns grades...” and “...no one takes attendance.” In this age of paid-for certification for MOOC participation this notion has changed, as whilst learning is still taking place as a supplement to formal learning there is a growing demand and expectation that informal learners want recognition for their achievements and engagement. This is reflected in the data from the 2013 and 2014 studies on OpenLearn (see Results).

The MOOC phenomenon has also impacted learners’ expectations of OpenLearn. Of the 5.3 million users visiting each year, the majority are searching for course-related content over short interactive learning pieces, joint OU/BBC programme information and blogs, which the site also hosts. Table 1 shows the search criteria for learners visiting the OpenLearn homepage for the period August 2013 – July 2014 (data excluded where search term is not known) (internal data).

Table 1: Known search terms for learners visiting the OpenLearn home page

<b>Known search terms</b>	<b>Percentage</b>
open university / the open university / open university uk	47%
free online courses / open university free courses / online courses / free courses / free online courses uk / free open university courses	32%
openlearn / open learn / study skills	21%

By repeating the study undertaken in 2013, we were able to compare data to: a) evaluate whether demographic data from the 2014 study concurred with 2013 data, and b) if any notable changes had occurred in attitudes towards informal learning provision, learners’ expectations and goals.

## **Results**

The following table shows a summary of the demographic data for studies undertaken in 2013 and 2014 on OpenLearn showing that 2014 data concurs with 2013 data. (There are some variations in age range following a revision for the 2014 surveys.) (Notable variations are shown in bold italics.)

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Table 2: Comparisons of demographic data for OpenLearn

	<b>2013 data (n=904)</b>	<b>2014 data (n=741)</b>
<i>What is your age?</i>		
0-24 yrs / 0-25 yrs	14%	17%
25-44 yrs / 26-45 yrs	38%	27%
45-64 yrs / 46-65 yrs	38%	39%
Over 65 yrs / Over 66 yrs	10%	16%
<i>What is your gender?</i>		
Male	41%	41%
Female	58%	57%
Other* **	>1%	2%
<i>Where do you live?</i>		
UK	67%	61%
US	6%	6%
RoW	27%	33%
<i>Is English your first spoken language?</i>		
Yes	81%	79%
<i>What is your highest educational qualification?</i>		
School	16%	16%
Vocational	9%	6%
College	23%	24%
Undergrad	26%	24%
Postgrad	20%	20%
None	6%	5%
<i>What is your employment status? (Tick all that apply)</i>		
Employed (full or part time)	58%	52%
Voluntary	5%	7%
Student	14%	15%
Unwaged	16%	9%
Disabled and unable to work	4%	6%
Retired	15%	18%
<i>Do you have a disability?</i>		
Yes	19%	23%

\* Other = 'transgender' and 'prefer not to say'.

\*\* Other = 'other' and 'prefer not to say'.

Informal learners were asked again if they would be willing to pay for educational content online. The table below shows results for OpenLearn learners where there is a small rise from 2013 to 2014.

Table 3: Respondents indicating that they would be willing to pay for certification assigned to informal learning

<b>OpenLearn 2013 (n=166)</b>	<b>OpenLearn 2014 (n=394)</b>
81%	86%

Table 4: Responses to the question *Which of the following free educational sites or resources do you use in addition to OpenLearn?*

(Learners could select more than one option.)

<b>Platform</b>	<b>2013 responses</b>	<b>2014 responses</b>
iTunes U	22%	16%
YouTube	25%	32%
TED	23%	25%
Khan	11%	15%
MIT OpenCourseWare	12%	13%
BBC Learning	45%	41%
Coursera	15%	17%
Open Yale	4%	5%
None of these	25%	13%

### **Internal response to research data**

Within a period of three months of analysing the data from the 2013 studies, the researchers' recommendations were acted upon internally: the relevant governance approval to proceed was requested; the BOC project team was formed and the IT requirements were initiated. In this way, a close relationship and feedback between institutional research and the business of informal learning provision was developed. By repeating these studies in 2014, we were able to show concurrence between 2013 and 2014 data and be content that the recommendations following the 2013 were for the right reasons. New channels for syndication of content have been established to reach new learners: free eBooks are now distributed through Google Play ([play.google.com](http://play.google.com)) (and shortly through Kindle); audio files are now shared on AudioBoo ([www.audioboo.com](http://www.audioboo.com)); and audio and video on Biblio ([biblio.org](http://biblio.org)) where thousands of new learners have found free educational content. Whilst we recognise that the majority of learners using educational content in English are educated and employed, we also recognise that a minority are not but that a small percentage of several million learners in this category is still a lot of learners.

This response to data, afforded by informal learning structures and created through simple research methods provides The Open University with a rapid response to changes in the focus of the informal learning curriculum that would be difficult to replicate in the formal curriculum. Additionally, understanding the usability challenges of learners using OpenLearn as a course environment has required the OU to make modifications to the Moodle platform, based on our understanding of learners' interactions with it and with each other – information which can be fed back to the formal student learning experience. Our research evaluating methods of assessment in the open through the badged open courses project and exploring how underserved and less educated groups can be motivated in an unsupported environment, will again provide an opportunity to impact on informal learners' experience in addition to that of the OU's formal students.

Recommendations from the 2014 studies will be the subject of future papers. However, whilst the approach to issue a suite of access-level badged open courses on OpenLearn was largely based

on data and a desire to meet the needs of a widening participation group, the discussion has extended to how we might serve other groups and to challenge how we recognise informal learning achievements beyond the issuing of certificates. Whilst FutureLearn, Coursera and other MOOC platforms charge for their certification, The OU will maintain the issuing of badges as recognition of informal learning for free. One of the questions for us researching informal learning in 2014/15 will be understanding whether learners' perceptions of paid-for certification as a recognition of achievement in informal learning has a greater value than that which is provided for free.

### Conclusions and next steps

We now have a good picture of our learners studying informally on OpenLearn and via third party platforms such as iTunes U. We recognise from both 2013 and 2014 data that our learners on OpenLearn are somewhere between Secondary and Tertiary OER users according to Martin Weller's iceberg model of OER engagement – i.e. that they do have an awareness of OERs in general (Secondary), but have little or no interest in licensing of content and are “consuming rather than creating” (Tertiary) (Weller, 2014). In fact, data from the 2014 study shows that awareness of free learning content is increasing (see Table 4). In the light of greater numbers of universities' participation in MOOC provision, availability of free informal learning content is increasing as is the understanding of what it means to deliver to open platforms and to third party platforms.

To research informal learning, assessment in the open (via badged open courses) and to gain a better understanding of who our learners are and what motivates them is ever more important. To exploit the rapid feedback from data to commissioning enables us to both positively influence the learning experience and to share findings openly.

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## DEVELOPING CRITICAL PERSPECTIVES ON TECHNOLOGY IN EDUCATION: A TOOL FOR MOOC EVALUATION

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### The Context

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; Poce, 2014). 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 same technique has then been applied to studying other disciplinary subjects and concepts accessing MOOCs, as described in the present contribution. Students are asked to evaluate the effectiveness of a massive open online course (MOOC) through their experience of learning online as outlined above. *Massive Open Online Courses* (MOOCs) are open access online courses, designed for distance learning involving large numbers of users. The term was employed for the first time in the “Connectivism and Connective Knowledge” module by George Siemens and Stephen Downes (2008), from the University of Manitoba (USA) and involved about 2200 online students, who did not pay any fees for their registration and attendance. As time went by, the number of open courses increased significantly, raising issues like the reliability of sources, correctness and quality of contents (Daniel, 2012; Stracke, 2014).

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. The goal is to overcome short term, instrumental learning which fails to exploit the educational potential of MOOCs. 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). As part of the aim to broaden the availability of a range of multimedia digital content, MOOCs arguably represent the most interesting digital products. The number of MOOCs is expected to grow rapidly over the next few years.

This paper describes how giving students the tools to carry out an evaluative analysis of MOOCs 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 MOOCs. The goal is to identify tools which enable the user critically to evaluate online resources and their impact on Higher Education teaching and learning.

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The research tests the following hypothesis: Students who use a specific system to evaluate the quality of MOOCs 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 MOOCs;
- to define new quantitative and qualitative indicators to evaluate the impact of MOOCs 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 MOOCs.

### **MOOCs description**

The MOOCs under investigation were created in the context of another research and training activity, carried out by LPS- Università Roma TRE, in cooperation with Salento University and DhiTECH (Apulia High Tech District). DhiTECH is a consortium established through the scientific research framework agreement signed in 2005 by the Italian Ministry of Education, The ministry to the Treasury, Region Apulia Local Authority, University of Salento, The National Centre for Research, and different private companies in the field of engineering and new technologies development. The aims of DhiTECH included training young professionals to develop their profiles as high tech innovators and entrepreneurs. The MOOCs, under investigation, here, were designed by graduate engineering students, under LPS researchers' guidance. The aim of the MOOCs was to develop principles and generic competences, which are central to entrepreneurship education. Graduate engineers were asked to create MOOCs on a set of areas of entrepreneurship education as part of their research and training programme. The aim was to provide the engineers with the opportunity to develop their profile as high tech innovators and entrepreneurs, specialised in specific fields of knowledge. They developed and demonstrated the skills and approaches, which enabled them to transform technology or generate research results based on a new business model. The ultimate goal was to create economic and business value through technological entrepreneurship. The student engineers were divided into groups and they produced six different MOOC prototypes, but just three of them were selected for the further evaluation process to be carried out by the Education students, based in Roma Tre University. They were the following: "Social innovation and entrepreneurship", "Business Model Canvas" and "From the business idea to the elevator pitch". The first topic is bottom up social innovation practices in developed countries. The course is addressed to young learners interested in developing an innovative idea within cooperative learning spaces, like *Fablab* or *Coworking*. The second enables learners to use a particularly helpful tool, the *Business model*, to define successful

business strategies. It focuses on how to draft an effective business model, which is meant as a starting point to develop new entrepreneurial ideas. The third refers to successful techniques in fundraising and how to approach a possible funder: the focus is driven on the characteristics of the so called “elevator pitch”.

## Methodology

30 students, attending the first level university degree in 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 were asked to participate in the three selected MOOC prototypes, as part of a compulsory internal training module (30 hours’ work), after approval of the Education degree course governing body. The task formed a compulsory curriculum module, which contributed to final certification. 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;
- MOOCs completion;
- Evaluation form, defined according to specific indicators created to assess the impact of MOOCs on Higher Education teaching and learning;
- Final focus group with participants in order to record students’ opinions, attitudes and evaluations on the realisation of the project, and to obtain possible suggestions for improvements for a further iteration of the training module;
- 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 MOOCs. 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 MOOCs with reference to those generic competences which are increasingly demanded by the labour market.

The questionnaire is divided into four sections:

1. 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).
2. 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.

3. 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* (Otten & Ohana, 2009). Questions, here, were related to self-assessment of the competencies acquired.
4. 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 MOOCs attended by Roma Tre Education students are presented and commented on below. Figures reproduced in this section refer to the evaluation of one of the MOOC prototypes under investigation: the “Business Model Canvas”. The other two MOOC prototypes under investigation were evaluated by the Education students using the same tool and received different evaluations, which are not inserted here for space reasons. These will be included in a further publication where comparisons and differences will be highlighted.

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 is a result in itself, because it could be employed to evaluate the impact of various technological instruments used in education and training.

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.

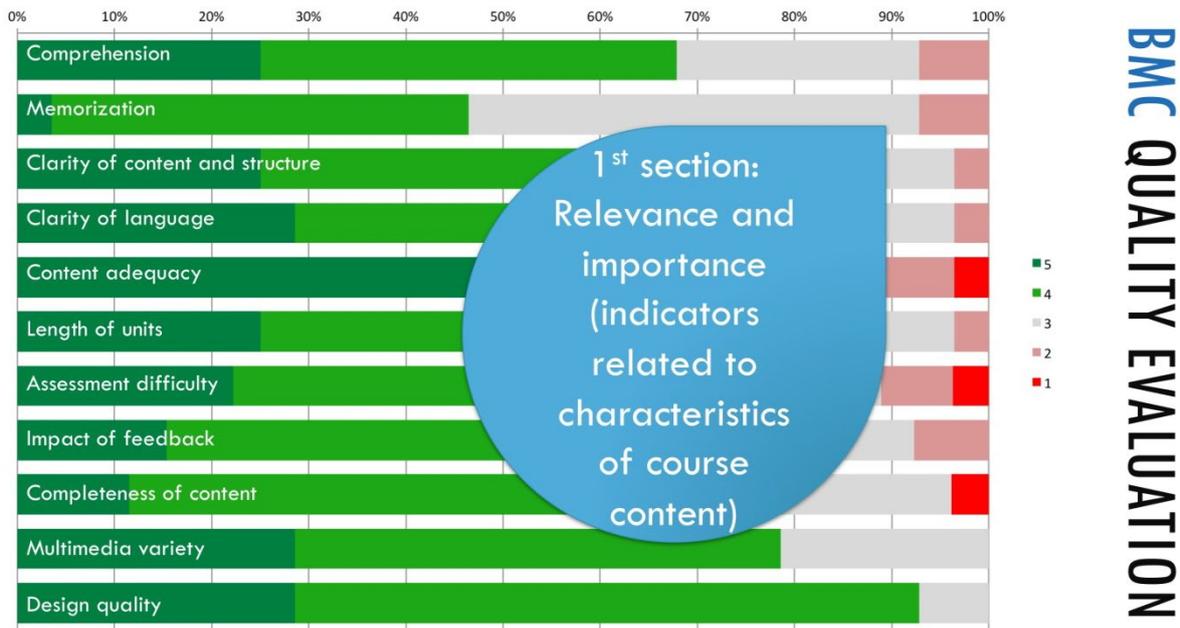


Figure 1. Quality Evaluation – Relevance and importance (indicators relate to characteristics of course content)

As regards breadth of *understanding*, *argumentation* and *justification* general evaluation was positive: almost 90% of the students strongly agree or agree with the statements “I learnt what I expected”, “I learnt step by step (growing difficulty)”, “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 analysed correctly.

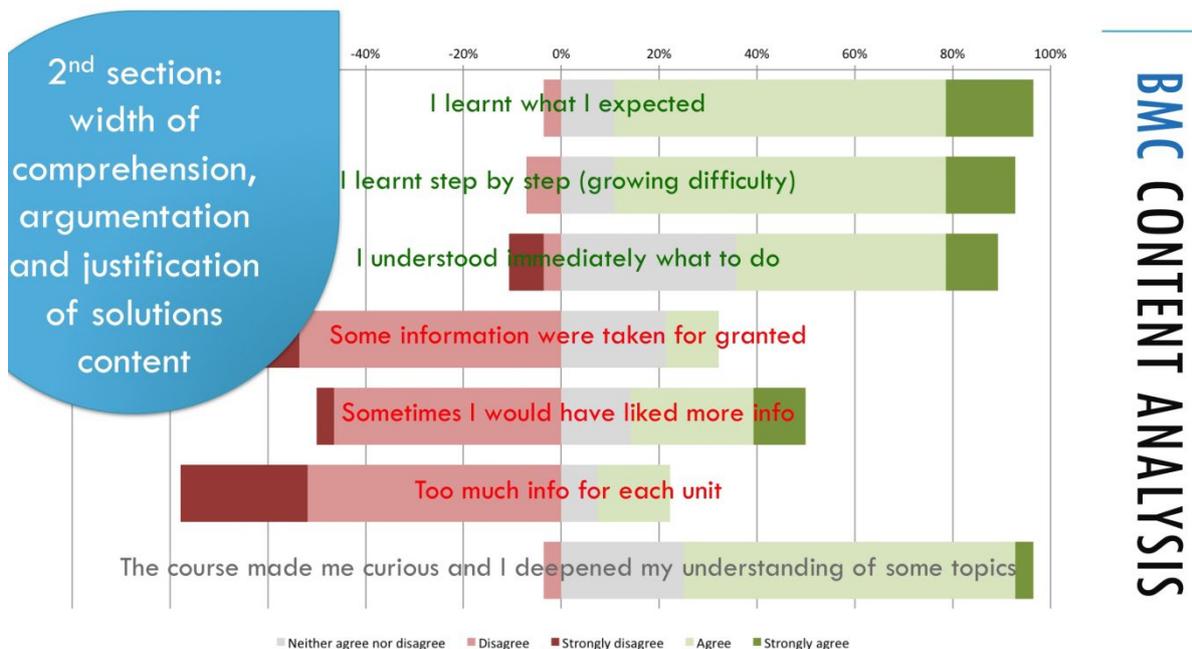


Figure 2. Content Analysis – Width of comprehension, argumentation and justification of solutions content

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As far as *critical evaluation* is concerned, it is entrepreneurial “frame of mind” the transferable competence (see Otten & Ohana, 2009) which was facilitated by the course participation, followed by creativity, innovation and problem solving. Memorizing is considered less involved in these sorts of learning processes.

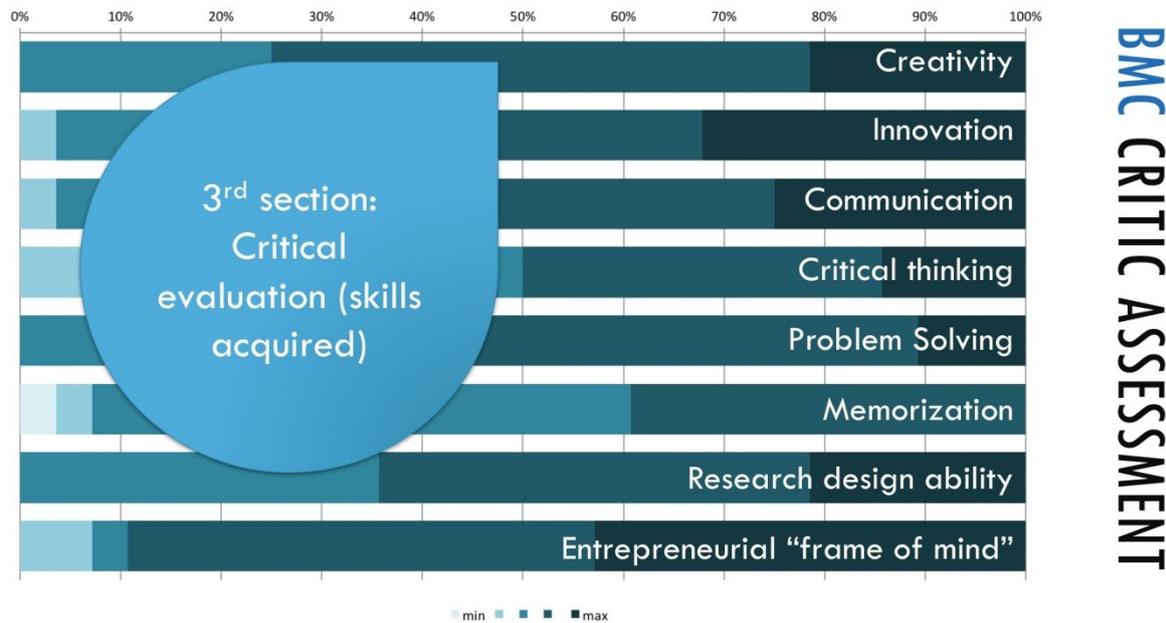


Figure 3. Critical evaluation (skills acquired)

As mentioned above, the analysis carried out through the evaluation form was enriched by a focus group activity organised by the research group at the end of the whole experience. All the students participated and three sessions were set to discuss their experience. They showed appreciation for the initiative and gave suggestions for the improvement of the development of the activities, taking into consideration a further release of this sort of teaching and learning activity. Though in Italian and taking into consideration that the meaning of words in isolation can be confusing if out of context, it is interesting to notice the results from the word tag cloud obtained, analysing the focus group’s contributions, which are still under detailed processing activity. Most frequent words are “corso” (course), “molto” (very much, a lot), “interessante” (interesting) “gruppo” (group), “esperienza” (experience), but also “difficoltà” (difficulty) which is often linked to the concept of *solution identification*, thanks to the cooperative work (“gruppo”) foreseen in the various courses provided. This last piece of evidence was considered very positively by the research group, because it means that every obstacle encountered was overcome thanks to the support of the group, interacting with other subjects engaged in the same task.



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## **A NETWORKED LEARNING FRAMEWORK FOR EFFECTIVE MOOC DESIGN: THE ECO PROJECT APPROACH**

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In the past two years a lot of attention has been given by the European Commission, as well as the European open, distance and digital education community, to the development of an alternative, more collaborative approach to MOOC design that has the potential to represent a solid qualitative alternative to the most commonly used models today. These models, which basically follow a trend originated at the top US universities that is broadly identified in the literature as 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. Within the framework of the EU-funded project *Elearning, Communication and Open-data: Massive Mobile, Ubiquitous and Open Learning* (ECO) a research team from a pool of institutions with experience in MOOC design conceived a model that attempts to meet the above-referred challenge. In this paper we present a description of the model and its most innovative features, its theoretical foundations and context of development, as well as scenarios of implementation. Through our definition of MOOCs and assumptions, principles and characteristics of the pedagogical framework it should become clear why a networked learning framework for effective MOOC design will be able to meet the ambition of European higher education institutions to develop an alternative, more quality-oriented and effective approach to a massive open online form of education delivery.

### **What characterizes an ECO sMOOC and what doesn't?**

Wikipedia defines a MOOC<sup>1</sup> as:

*“an online course aimed at unlimited participation and open access via the web. In addition to traditional course materials such as videos, readings, and problem sets, MOOCs provide interactive user forums that help build a community for students, professors, and teaching assistants”.*

In fact, this definition is not strict and already led to many discussions about what a MOOC is and what it is not. The ECO project has adopted the definition that it is an online course

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<sup>1</sup> [http://en.wikipedia.org/wiki/Massive\\_Open\\_Online\\_Course](http://en.wikipedia.org/wiki/Massive_Open_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. In our perspective, a MOOC includes educational content, facilitates interaction among peers (including some but limited interaction with academic staff), provides authentic activities and tests, including feedback (with well-designed rubrics for peer-assessment and AI engines for the integration of massive qualitative assessment), has some kind of (non-formal) recognition options and provides a study guide or syllabus.

ECO sMOOCs differ in several aspects from other types of MOOCs. ECO sMOOCs are “social”, since they provide a learning experience marked by social interactions and participation, and “seamless”, since ideally they should be accessible from different platforms and through mobile devices and integrate with participants’ real life experiences through contextualisation of content via mobile apps and gamifications.

Although we prefer courses with full access to full course content at all times (always accessible by anyone anywhere); ECO sMOOCs may have fixed starting and ending dates, depending on the institution’s choice. And although the definition refers to a potential unlimited number of participants, there can be a set limit due to availability of resources, as long as there is no enforced selection of participation. Most ECO sMOOCs provide an access route to credit-bearing curriculum as an additional service (to be paid for) next to other free recognition options, such as badges and/or a certificate of completion.

MOOCs should be inclusive and accessible to a wide diversity of citizens. They should allow a wide spectrum of approaches and contexts, accounting for a variety of languages, cultures, settings, pedagogies and technologies. ECO pays special attention to both people in risk of social exclusion and people with visual and hearing disabilities. The learning environment should enable mobile access, be available from every mobile device and allow for maximum usability.

ECO sMOOCs (and their platforms) are by definition multilingual, providing at least access in Spanish, English, Italian, French and Portuguese, and offer the possibility of contextualized learning through mobile technologies and gamification.

All contents in ECO sMOOCs have a creative commons licence (and are as such open educational resources). Open licensing policy is also preferred for the MOOCs platforms (open source) and for the data produced in MOOCs (open data) to improve learning and the educational offer.

With regard to pedagogical characteristics, ECO sMOOCs are do-able and stimulating by dedicated design, applying connectivist, socialconstructivist learning and/or situated practices as the dominant approach. The pedagogical approach supports independent learning and is learner-centred. In fact, they will create collaborative learning opportunities through a networked learning strategy. The model also supports adaptive learning strategies and

ubiquitous, pervasive and contextualized learning. As a result of this, ECO sMOOCs have the potential to adapt to the changing intentions of participants during the course.

## **Pedagogical model assumptions**

### ***ECO sMOOC concept***

The pedagogical model is aligned with the definition of ECO sMOOCs agreed upon and presented above. They are Massive, and Open, and Online Courses. They are a non-formal learning experience, although they will always have some kind of certification based on peer-assessment. Further formal accreditation that recognizes this learning experience may be obtained for a fee, but is not a part of the course itself.

### ***A model as a framework***

Because these courses can have a wide variety of target populations, purposes and local, contextual implementations, the model is designed as an open framework within which local and contextual choices are made and specified to make the courses effective. Contextual specified solutions that seem applicable to a variety of other contexts and found to enrich the pedagogical practices of these ECO sMOOCs can be later incorporated into the framework.

### ***Pedagogical approach***

Broadly speaking, the pedagogical approach draws on connectivism, situated learning and the general social-constructivist perspective that has always characterized online learning.

### ***Participants are learners, not students***

ECO sMOOCs are meant for adults, not for children or teenagers. We may refer to them as participants, individuals or learners, but not as students, since this is a term that defines a status/role in the context of formal education. People participate in this learning event becoming part of a learning community which, to some extent, is also a community of interests or a community of practice.

### ***Not a classroom approach***

The model is not designed for online learning in the context of formal education, nor for blended or technology enhanced learning in the same context. It is specifically dedicated to open courses, delivered online, that can theoretically have an unlimited number of participants. The context of reference is not the classroom, or the virtual class, but how people develop their learning by being part of online communities and networks.

## **Pedagogical principles**

### ***Learner is key***

The learner has a central role. Due to the high heterogeneity characteristic of MOOC participants in terms of competences, prior knowledge, personal motivation and goals, and also because of the non-formal, community-like nature of these courses, the learners are expected to take an active role in, and be responsible for their own learning, but also to actively engage in helping build a supporting learning community. Knowledge is built through reflection and practice (creation, production) and dialogue in a social collaborative context.

Success in this type of courses needs to be measured against participants' goals and intentions, and not against a rigid set of predefined learning outcomes. These may be defined to serve as a guide for participants in terms of knowledge or competences that can be acquired or developed in the course, but should not be the measure of success for everyone. ECO sMOOCs should also be able to adapt to the changing intentions of participants during the course.

### ***Learning through interaction***

Interaction takes place at various levels. It can happen with the materials and resources provided and those contributed and produced by participants; but also with other participants (in the learning community/network and/or in a group); and with community facilitators. Through these various types of interaction participants re-appropriate and recreate content, produce their own content, establish interconnections and interpersonal relationships, get and receive feedback, experience different perspectives and engage in the dialogue with others, which fosters real individual knowledge acquisition but also a shared construction of knowledge in a social context.

### ***Flexibility***

There need to be an articulation between autonomous and self-directed learning with a strong social dimension (collaborative learning), and also between the flexibility that online learners need with the pacing necessary to help them get things done. Very fixed and rigid learning paths, highly structured tasks with very fixed sequences (including rigid suggestions for time allotment), heavy interdependency of sequential tasks, or overuse of synchronous communication strongly reduce flexibility and increase transactional distance. Especially in the case of MOOCs, this can contribute significantly to the drop-out rate. Therefore, whenever possible, or to the extent to which it may be possible, an effort should be made to offer an alternate learning path (more focused on the interaction with the materials/contents, for example, for those who cannot keep the pace of ongoing interaction and dialogue around the current topic), reduce the dependency between different topics/activities, allow for choice in the way participants demonstrate their knowledge, allow for different ways of completing a task (individual, group, different formats, open ended tasks, etc.), offer optional challenges to

be completed at participants' will, and include synchronous events moderately, and only when they are relevant.

### ***Digital inclusion***

One of the challenges of 21st century learning and of providing a solid base for lifelong learning is to make learning available to as many people as possible, bringing these people into the digital online environment, where a crucial part of modern life happens, thus helping curb the digital divide.

### ***Ubiquitous learning***

In accordance, whenever possible or adequate, courses should support context information and tasks by ubiquitous, pervasive and contextualized learning through mobile technologies. This will reinforce learner-centeredness and flexibility, as well as increase the possibilities for interaction, creating a richer and more diversified learning environment whereby participants can resort to a wider variety of resources, contexts and situations to engage in the course experience.

## **Typical characteristics of the pedagogical approach**

### ***Access and registration***

Courses are open to everyone who wants to participate. Registration is required to add contributions and publish in the learning environment, but all course contents are accessible to anyone.

### ***Duration and structure***

The course should run for about six weeks, a duration which seems, from empirical data, to work well. The first week should be dedicated to the familiarization process – a sort of “boot camp” to get participants acquainted and familiar with the environment, technologies and work and communication processes to be used throughout the course. This is a key phase in the process and may contribute significantly to a better retention rate, not only because it gives participants enough time to become sufficiently proficient to be able to work and communicate before starting to engage with course contents, but also because it fosters the development of the learning community that is paramount in this approach. The remaining weeks should be organized around topics, with suggested activities and resources tied to these activities to explore these topics and support learning.

### ***Learning environment***

The learning environment should be intuitive and require only a short adjustment period, which can be achieved in the introductory, boot camp week. If a typical virtual learning environment is used (VLE/LMS), it needs to be enhanced with social features, or combined

with a community/network-like environment to foster relationships and interactions. It is imperative to avoid “school-like” or “classroom-like” environments as the main space where activities take place and participants publish and interact. Some key features are: an activity stream, rich profiles, a personal writing space (blog or equivalent), a user dashboard, micro-blogging (like Twitter) or updates (like Google+ or Facebook), and the possibility for group creation by participants or by course organizers to support group tasks and social connections.

### ***Learning process***

Learning is learner-centred and based on the realization of e-tivities. Learning should be evidenced through the creation of artifacts (texts, videos, presentations, audio podcasts, mind maps, etc.), published online and freely accessible, that demonstrate the learner’s reflection, knowledge or competencies regarding the material studied and the topics being addressed. The learning process combines autonomous self-study and reflection with interaction with other participants in an open social context. Participants are thus expected to take an active role in, and be responsible for, their own learning, but also to actively engage in setting up a supporting learning community.

In a networked/community learning setting, collaboration does not mean “to work in a group”. Collaborative learning results from people sharing artifacts, either created by them or by others, providing links to relevant resources, aggregating useful information and taking part in the dialogue and interactions that develop within the network/community.

### ***Teacher’s role***

A non-formal, free course cannot rely heavily on teacher time and presence. Teacher participation in the course needs to be very well thought through. Learning support cannot be assured through direct and ongoing teacher intervention, nor through direct and systematic intervention of the facilitators. Teacher presence is created through the Learning Guide, the detailed instructions for the tasks, some resources (video and/or audio presentations) and a weekly feedback message, based on the information prepared by the facilitators’ team.

### ***Learner’s role***

Success in a MOOC needs to be measured against participants own goals, interests and satisfaction level, not against predefined learning outcomes. Given that the learning process lies on the participants and that they have a responsibility to sustain a learning community, it is important to maximize, recognize and reward the effort and contribution of the most interested and motivated users, so that they can serve as role models and incentivize others to be active. Whenever possible, badges and/or a “reputation” system should be put in place to stimulate and recognize/reward engagement by participants.

### ***Facilitators team***

A small team of volunteers should be recruited in order to collaborate with the teacher or teachers leading the course. This support team will gather information that may be relevant to better run the course and substantiate the teacher's weekly feedback, act as "community facilitators", monitor social or information networks for course related content and help out in setting and deploying the synchronous sessions, polls, peer assessment and other tasks considered necessary.

### ***Activities***

Typically, activities have a weekly schedule. Activities shouldn't be too rigid, with heavy dependencies between tasks and very structured paths, which makes it impossible for people to recover or come back in the course if they lag behind at some point. A variety of suggested tasks should be made available, supporting and scaffolding participants' exploration, reflection, production and dialogue. As far as possible, these tasks should be authentic, i.e. emulating or mobilizing real life settings, drawing on participants' personal and professional experience, flexible and open ended, which means participants should ideally have a fair amount of choice concerning the process of performing the task and its output. Group-based tasks can be an interesting and valuable strategy for some learning situations.

In addition, a collection of "challenges" should be made available. If they have the time or want to do some extra work, participants can choose some challenges from the bank to complete. They can obtain badges for successfully completing these challenges and later include them in their e-portfolios. This adds flexibility and diversity to the learning experience.

### ***Learning materials***

Resources provided as support for learning are presented in the context of a learning activity, not as items in a repository. All resources and materials should be licensed as Open Educational Resources or freely available on the Internet. Ideally, the video and audio resources provided, besides being available through streaming, should also be made available for download in formats compatible with most devices. Artifacts produced by participants as evidence of their reflection and learning become part of the course materials, i.e. they are available for other participants to learn from. Participants should be encouraged to use an open license for their artifacts, but ultimately they will be licensed according to the authors' preferences.

### ***Communication***

Communication needs to be carefully planned. Regular messages, such as the weekly feedbacks, help to maintain the focus and the "teaching presence". Video or audio can be used sparingly to increase the perception of "teacher presence".

Two key elements to support and scaffold learning are a) the learning guide and b) the detailed guidelines for the suggested tasks. The learning guide aggregates all the necessary information participants need in one single place/document. The detailed guidelines describe for every task the learning goals, workload, outcomes and instructions on how to perform the task.

### **Feedback and assessment**

Formative assessment with self-correction should be made available (through tests, quizzes, etc.), focusing on relevant aspects of the topics being discussed or important elements in the resources provided. Participants must also be encouraged and are expected to discuss and give feedback to one another throughout the learning activities. A regular, more general feedback on the work done each week should be provided by the teacher. Additionally badges for completion of tasks or challenges, and the points/status/likes/pluses etc. gained from reputation systems, can be used. Self-assessment quizzes can also be used as diagnostic, to anticipate relevant content presented in a resource.

### **The gamification element**

Kapp (2012) defines game as “a system in which players engage in an abstract challenge, defined by rules, interactivity, and feedback, that results in a quantifiable outcome often eliciting an emotional reaction”. Gamification, at higher or lower levels of implementation and complexity, depending on the needs and intent of course organizers, can be used to enhance communication and interaction in the learning community and provide a more rewarding and meaningful learning experience.

- Story Mode / Challenges: contents and objectives are structured under a story-like narrative that encourages emotional engagement to the course material.
- Badges, Levels and Points: Badges could be awarded to participants when completing special course actions. Achievements are mainly designed to encourage interactivity and engagement in the course.
- Karma System: Karma is a numeric indicator of the participants’ level and quality of course engagement. It could be developed in two ways:
  - Forum Karma: Thumbs-up/thumbs-down in forums to encourage interactivity and high quality submissions.
  - General Karma: An additional algorithm that includes forum karma, badges/points and achievements could be created to provide a user’s general karma.

### **Scenarios for possible implementations of the ECO sMOOC model**

ECO targets teachers, tutors, learners, institutions and industrial players. One of its main target groups consist of teachers, teacher trainees and teacher trainers. On the one hand, teachers need to be educated and trained in the design and use of MOOCs, in their role of

learners. On the other hand, these teachers will also design and provide MOOCs, in their role of teachers and tutors. The main aim is to present new forms of accreditation of knowledge concerning processes of communication, creation and utilization of MOOCs.

ECO also aims to bridge the gap between social classes in their access to education and support them, in particular, in developing key competences such as digital skills. MOOCs can attract participants who might otherwise not be able to attend traditional on-campus instruction because of work, family and other obligations. The diversity among MOOC participants is very high, attracting people with different cultures, motives and intentions. Moreover, they don't always come with clear, well defined learning goals, and their personal objectives might even change during the course.

The model can be implemented using an instructional design approach based on the different characteristics of *personas* within these target group(s) as, for example:

- Persona for an ECO MOOC designer/teacher;
- Persona for a MOOC participant;
- Persona for a group / subnetwork;
- Persona for a MOOC teacher/participant with high risk of exclusion due to special needs;

Scenarios for possible implementations offer more concrete and more detailed examples of how particular courses, or particular strategies and solutions, can be designed and implemented within the framework of the pedagogical model, depending on the specific nature, needs and intents of these courses.

## **Conclusions and future research**

In the last three years MOOCs have become a viral phenomenon in higher education. Their rapid success has drawn many institutions worldwide into developing courses, most of them lacking any consolidate expertise and experience in open, distance or online learning or applying inadequate theoretical frameworks and established practices to the emergent new field. Similarly to what happened in the historical development of the Open Educational Resources (OER) movement, after a first enchantment with the potential of this new concept, a disillusion with actual results of the learning processes has arrived. As with OER, research needs to develop new practice models built upon appropriate foundations. New models that respect the principles of open education and take the most out of the new networked social environments. Moreover, in order for practice to be really effective, these new models must be embedded in a new educational and institutional culture. Otherwise its implementation will not bring substantial change and will not contribute to the improvement of the actual learning experiences provided.

The framework developed by the pedagogical research team in the ECO partnership recognizes this challenge and has embraced it. We have designed a solution that relies heavily on a compromise between actual innovative practices of the partners involved, who have a

relevant experience in networked learning and/or have been providing MOOCs based on the same pedagogical principles, so there is some evidence as to its validity.

We are still at an early stage and thus there aren't any real experiences with the ECO pedagogical framework yet, since the ECO sMOOCs are being presently designed and developed and will be launched in November, 2014. However, the scope and scale of the experimentation will feed extremely significant results to test the validity of our assumptions. In the remainder of the project the quality and validity of the aims of ECO and the pedagogical framework will be evaluated. There are ten providers, each offering at least one sMOOC, with a total of some 20 sMOOCs being made available. The aim is to get a minimum of 50,000 participants involved in these sMOOCs and, additionally, train 4000 teachers to create their own sMOOCs. These pilots should offer sufficient data to conduct a careful evaluation of the pedagogical model, including the conditions for sMOOCs, the inclusiveness of special groups at risk, and reach of intended target groups. Each sMOOC will be run three times. Findings of each run will be used to improve the pedagogical framework.

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## **ASSESSING TRANSFORMATIONAL LEARNING IN ONLINE PROFESSIONAL PROGRAMS: METHODOLOGICAL APPROACHES AND CHALLENGES**

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### **Introduction**

In the last decade, online education has increased access to institutions of higher education and equity for non-traditional populations. Developments in ICT have led to an augmented number of online professional programs for adults, where adult practitioners look for accreditation or advanced degrees. Online professional programs offer students professional growth and attempt to connect theory and practice or theory, research and practice, with goals of transformation in thought, behaviour and action. In online professional programs where the educational design carefully scaffolds and aims for transformation, students should ideally be better able to make connections between practice and theory or research because they remain embedded in their practice and their working environments as they continue their education. The impact of such programs is often reported as the impact for the individual and for their workplace, with the impact for the individual focusing on transformation as well as professional growth (Lester & Costley, 2010). In this paper, we will investigate transformational learning in online professional programs, paying special attention to how such transformation can be assessed.

Transformation in students' thought, behaviour and action in professional programs or in related work-based learning environments has been studied using methods such as student, faculty and employer interviews; observations and analyses of student work. Researchers have also proposed that transformational learning should be studied as a process and not as an outcome at the end of a course or program (Land & Meyer, 2010). However, in the online environment where faculty and researchers rarely meet students face-to-face and where the workplace is located in another state or country, research on the assessment of transformational learning becomes problematic. At the same time, the access to a record of all interactions in the online environment and learning products in digital format presents new sources of data and opportunities for research such as learning analytics. Given this situation, how can online professional programs assess that they are achieving what they set out to do? What existing methodological approaches can be applied to assess transformational learning in online programs or are new approaches needed?

In this paper we present two approaches to assessing transformational learning in online professional programs, discuss the shortcomings and benefits of each approach, and the general challenges associated with identifying a methodology for assessing transformational learning and implementing it in an online program. Furthermore, we depict the challenges faced when assessing transformational learning as a process at different points of an online program, and when using embedded assignments within a program. Our focus is on these methodological issues; we provide a brief description of the educational design of each program to provide context, but a detailed discussion of the educational design, albeit valuable, is beyond the scope of this paper. Given the increase in non-traditional students pursuing higher education opportunities through online programs, this paper addresses an important issue – that of assessing the impact of online learning for adults not just in terms of knowledge acquisition but in terms of learning outcomes such as changes in thinking, behaviour, action and identity.

## **Transformational Learning and its Assessment**

*Transformational learning* aims for changes in an individual's perspectives (beliefs, attitudes and behaviour) that can be facilitated by critical reflection and critical discourse (Mezirow, 1998; 2003). Mezirow describes various phases within the transformational process – the introduction of disorienting information, self-examination, critical reflection on the first two areas and these leading to new plans of action, building of self-confidence and eventually a comfort level with new roles and ways of thinking (Mezirow, 1998). While he emphasizes that the learner should be willing to learn, Boyd and Myers (1988) assert that learners have to be receptive to the possibility of transformation and discern that existing premises and perspectives are no longer relevant for their future practice. In the case of online professional programs, students often enrol because they want to acquire new knowledge or ways of thinking, although some might enrol because they need the additional qualification. While some students might be defensive and cling to old ways of thinking or action despite disorienting information (Schwartzmann, 2010), the purposeful design of educational experiences can facilitate transformation.

More recently, “a transformed way of understanding, or interpreting, or viewing something” has been termed possible through a threshold crossing (Meyer & Land, 2003, p.4). Threshold crossings involve threshold concepts that are transformative because they lead to a changed outlook on a discipline or changes in personal identity, but are also integrative because the student connects previously unconnected issues to discover their “hidden interrelatedness” (Meyer & Land, 2003, p.4-5). Exposure to knowledge from a different area of discourse that contradicts what students already know and believe, or knowledge that is incoherent or incomplete becomes troublesome for the students. Land and Meyer (2010) describe transformation as a journey through preliminal, liminal and postliminal stages where the “state of liminality” (Meyer & Land, 2003, p.10) is where students struggle to integrate new knowledge or feel a loss of authenticity in their understanding before they can cross the

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threshold to reach new understanding or let go of old understanding. Once a student's understanding is reconfigured or transformed, this is irreversible and is marked by changes in discourse, actions and behaviour.

*Assessing transformational learning:* According to Land and Meyer (2010), transformational learning is not sequential, with the three states or new understanding constantly being negotiated and a subliminal mode underlying the transformational process. Thus any measurement approach has to take into account changes in thoughts, behaviour and action at various stages of the learning process and not only at the end. A broad spectrum of quantitative and qualitative methods has been used to assess transformational learning in the past such as student interviews, student biographies, surveys, open-ended survey questions, portfolios, logs, student journals, and concept maps (Land & Meyer, 2010). However, these mostly relate to courses, not to complete programs or to assessment that occurs consistently over semesters or years. Land and Meyer (2010) point out that transformational learning in *programs* needs to be studied to understand students' growth across courses. However, in online programs additional challenges arise. Firstly, online programs often comprise a sequence of courses where the courses may be excellently designed for individual learning outcomes, but the complete curriculum might not be aligned for program outcomes. In online professional programs that aim for transformational learning, activities and resources as well as online discourse and interactions across courses have to be carefully scaffolded for cognitive and ontological change. However, while existing face-to-face programs might be more difficult to redesign, the fact that several online professional programs are new makes it possible for them to be planned and designed in this manner. Secondly, students are working professionals situated at a distance, making it difficult to collect data that involves synchronous participation such as interviews or talk aloud protocols. At the same time, the digital record of student work and interactions provides rich sources of data to be analysed. In addition, researchers can assess transformational learning during the online study program, over multiple semesters and years with assessment methods that are built into the courses as "jewels in the curriculum" and using digital tools that help students "externalize" their thought processes (Land & Meyer, 2010, p.75).

The following sections present the design of two online professional programs for practitioners in social work and educational technology, respectively, that included assignments in courses as well as other methodologies to investigate transformational learning. The discussion section then compares the two approaches and their accompanying benefits and challenges, along with implications for further research in online professional programs.

## ***Assessing Transformational Learning I: Online BA-Degree Program in Social Work***

### *Educational Design*

The online BA-degree program in social work “BASA-online” is offered to practitioners in the field of social work by Munich University of Applied Sciences, Germany. Students from a wide range of work backgrounds, enrol in the program to study in a networked learning setting that comprises of online modules and face-to-face modules. The online modules are offered in a learning management system, using a variety of additional learning technologies, and involve individual, pair and group work. A key design feature of the program is the embedded assignments: tasks that ideally link the content of the module directly with the students’ work experience. In addition, the educational design offers ample opportunity for the students to share their individual work experience within the learning community, trying to support the students’ trajectories toward becoming reflective practitioners (Schön, 1983). As students have professional experience in very different fields, it becomes challenging to build on their work experience and to support all students in linking theory and practice across the multiple modules in the program that are taught by different faculty members. To facilitate the interweaving of academic knowledge with students’ professional experience, a special online module aims especially at enabling the students to reflect on their threshold crossings and possible transformational learning incidents in the overall program. As an embedded assignment for this module, students develop an individual e-portfolio, show-casing their learning insights and outcome within the module and the program, reflecting on the underlying processes, challenges and approaches to confront these challenges (for details cf. Arnold & Kumar, 2014; Arnold, 2012). For show-casing and reflection within the e-portfolio students use text, images or audio and video elements.

### *Methodology*

To assess transformational learning incidents and threshold crossings in the program, students’ e-portfolios were analysed. A pilot analysis of the portfolios was undertaken to investigate whether students experienced transformational learning during the program, with no extra funding for impact research (Arnold & Kumar, 2014). The research design followed Carley’s (1993) recommendations for content analysis. Taking into account the importance of defining initial indicators, we looked at the goals of the program and scrutinized the comments from lecturers who had previously taught in the program to develop six initial indicators:

1. Relating content to one’s own person,
2. Relating content to one’s professional experience,
3. Commenting on the relationship between theories and practice in social work,
4. Describing the significance of scientific knowledge for profession,
5. Changed way of thinking,

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### 6. Changed way of acting.

We also remained open to new indicators that might emerge from the data. Our coding approach was entirely qualitative, i.e. we searched for the existence of any of our indicators and did not introduce a quantitative measurement in terms of counting the prevalence of a certain indicator. The unit of analysis was a sentence or a graphic in the e-portfolio. To make sure that we were “coding for what we want to code for” (Carley, 1993, p.83) and as a way to reach consistency, we discussed the coding. In addition, we paid particular attention to any coding that seemed problematic to any one of us at the start and revisited the coding mutually. Introducing a second perspective also helped to gain trustworthiness in the process of analysis.

### *Findings*

The analysis of 21 e-portfolios clearly showed traces of threshold crossings and transformational learning. Students reported that they connected new knowledge to their personal and professional life and changed their perception of the relationship between their situated-in-practice work knowledge and newly acquired theoretical concepts. They valued the enrichment of perspectives and acknowledged the intricate interwoven nature of the theory-practice relationship rather than the duality of the two genres of knowledge that was at the forefront when they started the program. In sum, the study program seemed to have made students cognizant of the significance of academic knowledge for professional social work. For many students their aspirations for their future professional role became more realistic and nuanced, from an “all-mighty angel” (“Lichtgestalt”) to a competent advocator and mediator for people in challenging life situations. Although the e-portfolios were self-reports, they gained credibility by very individual examples and detailed situated descriptions of the changes in thought, attitude and values, deeply grounded in students’ particular work and life situations.

Regarding the methodology as such the set of indicators had to be extended as many incidents of “troublesomeness” emerged, when students struggled with new concepts, coming to terms with them in their own perceptions and cognition or when transferring them into their practice, being confronted with conflictive reactions of colleagues. This indicator was not originally applied to the material but corresponds to the Meyer and Land’s (2003) notion of troublesomeness. In addition, the fact that students were granted many degrees of freedom when creating the e-portfolio resulted in challenges with coding diverse language and writing styles as well as highly differing use of multimedia elements in the e-portfolios.

## **Assessing Transformational Learning II: EdD in Educational Technology**

### *Educational Design*

The goal of the Doctor of Education (EdD) in Educational Technology at the University of Florida is for practitioners to identify educational problems, apply theory and research to problems of practice, and enhance educational environments based on data-driven decisions

and research. The online cohort-based program is structured as two years of intensive coursework followed by individual mentoring of practice-embedded research dissertations. It enrolls educational technology professionals from multiple disciplines who work in schools, post-secondary, corporate, non-profit, and other educational environments in the US and abroad. The design of the program is grounded in situated and transformational adult learning that is embedded within students' professional contexts (Brown, Collins & Duguid, 1989; Mezirow, 2006). Given the diverse backgrounds of the students, the program is designed to guide students to build on prior knowledge in their discipline, acquire knowledge in the field of educational technology and specialize in an area in educational technology that corresponds to their professional interests. Required courses systematically introduce students to theories and research in the field, which students critique and discuss in the context of their prior knowledge, own purposes and values, and professional context, thus making connections between theory, research and practice. The cohort structure of the program provides students opportunities to engage in reflective discourse and simultaneously be exposed to different points of view (Mezirow, 2003). Authentic learning experiences, expert modelling and mentoring, and exposure to research in educational technology are integrated using both synchronous and asynchronous technologies to build an online community of inquiry over two years (Kumar & Dawson, 2012). Such activities are intended to bring about cognitive, epistemological and ontological transformation throughout the program and not just in one course. Students produce artefacts that are relevant in the original contexts of identified problems (Brown, Collins & Duguid, 1989) and represent their learning and professional growth in both text-based and non-text-based formats. The educational design of the program emphasizes the connections between theory, research and practice in students' exploration of literature, reflection on new knowledge and implementation of research in their dissertation.

### *Methodology*

Traditionally, the impact of participation in professional graduate programs for learners was expertise, confidence, recognition, responsibility, and stature in their workplace (Lester & Costley, 2010). Based on these categories, data collection in the online program focused on external indicators of threshold crossings such as application of knowledge, changes in behaviour, and professional growth, with attention paid to the role of learning from the program. Due to the importance of collecting data on transformational learning at different points of the process, research with the first cohort of students in the online program involved virtual semi-structured interviews (n=19) during the 2<sup>nd</sup> year, CV analysis (n= 19) to corroborate interview data, focus groups with 18 students during the 3<sup>rd</sup> year, and virtual interviews after the students graduated from the online program (Kumar, 2014). Interview and focus group questions aimed to investigate whether students experienced transformational learning as indicated in their behaviour or professional growth and application of knowledge in their practice. Inductive analysis (Hatch, 2002) was conducted by

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two researchers for each set of qualitative data and member checks, data triangulation, and follow-up emails ensured trustworthiness of data.

### *Findings*

The data analysis revealed that students reported a clear change in their thinking, actions and behaviour related to educational technology use and research, with students providing concrete examples in the following areas: a) students' application of learning from the program in the form of technology integration as well as teaching materials, courses, professional development and workshops; b) new actions taken by students in participating, presenting and proposing papers to organizations or conferences; c) students' changed approach to being research-based and theory-based, using and sharing research and applying research or data-driven approaches in their practice; d) students' changed behaviour with peers, administration, superiors at the workplace and scholars; and e) students' changed self-perception in terms of confidence, competence and ability to take risks (Kumar & Dawson, 2012; Kumar, 2014).

In terms of methodology, the qualitative procedures revealed several themes in terms of impact that had not been anticipated when the research was planned. Furthermore, the research had focused strongly on products that evidenced changed action (materials, modules, workshops, conference presentations), changes at the workplace as a result of the program, and changes in behaviour, but in the data collected, the students were also trying to describe internal changes, their own struggles with change and their surprise at how they had changed. Simultaneously, virtual interviews with the second cohort of students proved difficult due to differences in time zones, students' work and family commitments and lack of funding. Thus, for the third cohort of students, virtual artefacts that students anyway created as assignments were purposefully focused on transformational learning. Students created a virtual artefact during their first semester about their professional journey, knowledge of their area of specialization and perceptions of research, educational technology and their role in their workplace. At the end of the second year, students will again be asked to create a virtual artefact with the same instructions. A set of indicators will be created based on program goals and from research in the BASA-online program and the pre- and post-artefacts will be analysed for crossings and transformational learning.

### ***Discussion: Assessing Transformational Learning in online programs***

In this section we discuss (i) the differences in the two approaches adopted by the two online programs to assess transformational learning with regard to their special affordances as well as disadvantages and (ii) the challenges associated with assessing transformational learning in online programs common to both programs.

### *Comparing the approaches*

For assessing transformational learning, in the online doctoral program in Educational Technology, a research plan was created to collect data using various instruments (interviews, focus groups, cv analysis) and the persons conducting the interviews or focus groups were not part of the online program. Data collection thus focused on external indicators of transformational learning in the form of student-reported changes in behaviour, actions, materials or educational experiences created, and professional growth. This approach can be characterized as “analysing from the outside”. Although the research design was conceptualized by the program director in collaboration with researchers outside the program, it included external lenses and input and furthermore, used proven methods of data collection. While this approach was quite successful, it did not reflect the students’ internal struggles or thinking. Simultaneously, students were creating artefacts during each semester that externalized students’ thinking or transformation but that were not being analysed. Thus the researchers decided to re-examine the instructions for course artefacts that required students to connect theory, practice, and research within the program, and focus them further on transformation and program outcomes in order to be able to analyse them later, enriching the “outside approach” with an “analysis from within”. Another downside of this approach is that it requires a lot of resources and time, both from researchers as well as students. Such methods of data collection are often an additional demand on the budget and professional students’ time, in this case further complicated by the reality of a geographically dispersed cohort.

In contrast, for assessing transformational learning in the BASA online program the program director did not adopt an external approach to data collection, but employed an internal one. The program contained “jewels in the curriculum” (Land & Meyer, 2010, p.75) or assignments that served to evaluate to which degree students reached the learning goals of connecting theory and practice. One example of this was the task of creating an e-portfolio reflecting student’s own learning trajectory. The researchers created a framework for analysis and applied it to the artefacts to identify transformation during the program. This approach did not require resources for data collection or additional time invested in the research by the students, for whom time is a very scarce resource. On the other hand, in this method of analysis students’ different affinity to the digital format of an e-portfolio might interfere with the discernibility of the coding concepts in the material. Researchers thus would have liked the possibility to validate results with an external approach, such as in-depth interviews with students. In such interviews it would also be possible to check results that stemmed from the analysis of very special e-portfolios; e.g. portfolios that used a high level of multimedia elements or used a more distanced writing style. These factors might have unduly influenced the coding and the interpretation of data.

In general, both approaches were found to be reasonably successful, and moving forward, the researchers see merit in a combination of the internal and the external approach, namely, collecting data in a traditional manner using surveys, interviews, or focus groups, and also

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analysing artefacts or student work submitted during the program for instances of transformation.

### *Challenges common to both approaches*

Regardless of whether the approach used is a research plan or the analysis of artefacts embedded as assignments, several challenges emerge when attempting to assess transformational learning in online professional programs that are heightened when participants are professional adults with families and other care obligations. Access to participants and the scheduling of data collection pose problems due to time zones and the fact that participants might not be able or willing to invest extra time. Qualitative data collection in virtual environments (e.g. Skype, phone calls), while becoming more common, is accompanied by limitations such as not being able to document body language or facial expressions, interpret pauses or tone of voice, etc. From a methodological perspective, when collecting data at various points in an online program, the availability of resources is essential for a longitudinal study and there is a danger of exhaustion when asking students to participate in data collection every few months.

Of even more concern are the problems of student self-report and researcher bias. When students are asked about their professional growth and actions taken during an online professional program, they often want to present themselves and their behaviour or actions in the best light possible. Often researchers cannot follow up with the students' workplace, so they have to rely on the students' self-reporting. The doctoral program attempted to triangulate the data by requesting evidence of products created by students and by reviewing students' CV or professional websites, but that process presumes that students update those sources regularly. Using data sources to validate changes in behaviour, a changed approach to theory or research, or changes in identity is even more difficult. Embedded assignments in the curriculum that require students to keep a journal or create artefacts to report changes in their thinking are also essentially student self-reports because the students know the journal is being kept for that purpose and each student can be identified. The fact that the journal or artefact is part of an assignment in the program that will be graded complicates the issue even further and raises ethical considerations for the research. In such cases, the collaboration with external researchers who are not involved in the online program can be useful. Employing concept maps or artefacts that require students to solve a particular problem and analyse whether their approach has changed at various parts of a program could also be a solution.

In the case of the two online programs discussed in this paper, the program directors who led the educational design also directed the research. Although they were not directly involved in data collection, they contributed to the analysis of the data along with other researchers. Their interpretation of the results might have therefore been skewed by their involvement and investment in the program. It is also possible that students consciously or unconsciously provide data that they think will please the researchers, because they do not want to be critical of their study programs.

## Conclusion

This paper presented two different approaches as possible methodologies for assessing transformational learning in online professional programs. For the online doctoral program in Educational Technology, a research plan was created to collect data using various instruments, representing an external approach. In contrast, the BASA online program adopted an internal approach to data collection. The program contained “jewels in the curriculum” (Land & Meyer, 2010, p.75) or assignments that served to evaluate the learning goals and that were analysed using a research framework. Both these approaches were found to be reasonably successful, but had their respective pitfalls and downsides. Given adequate resources, a combination of the methodologies would increase validity of results in both contexts and further work will proceed in this direction. On the other hand, some interfering factors related to assessing transformational learning in online professional programs seem to be difficult to eliminate altogether. A further area for research that was outside the scope of this paper is to investigate how the educational designs lead to transformational learning outcomes, and unpacking which elements of educational designs facilitate transformational learning most.

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## **A REVIEW OF A FACULTY-WIDE CHANGE IN ASSESSMENT PRACTICE FOR OPEN AND DISTANCE LEARNERS OF SCIENCE**

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### **Background**

On most of their modules of study, students at the UK Open University (OU) encounter both continuous assessment (comprising tutor-marked assignments (TMAs) and sometimes interactive computer-marked assignments (iCMAs)) and an end-of-module project or examination. Both the continuous assessment and the end-of-module assessment are summative in that they are graded and the outcomes of each contribute in some way to students' overall module results. However detailed feedback is provided on TMAs, and in terms of learning design, continuous assessment is largely formative (Wiliam & Black, 1996) in the sense that it is "for learning" (Black & Wiliam, 1998).

It has been pointed out that in such a "double-duty" model (Boud, 2000), assessment's formative and summative functions can be difficult to balance (Giorka, 2008; Price et al., 2011) with the formative function sometimes "getting lost" (Brearley & Cullen, 2012). Staff and students have also been observed to have a different understanding of the purpose of continuous assessment: Staff may see its purpose as primarily formative, but students are primarily concerned with obtaining high marks. There was a wish to free students from anxiety over the minutiae of grading of TMAs and iCMAs, placing greater focus on feedback and dialogue between students and their tutors.

There was also a wish to establish more honest assessment strategies. In practice, the summative nature of the continuous assessment was somewhat illusory for the vast majority of the students under consideration because their course grade was actually determined by their exam mark, which was generally significantly lower than their continuous assessment mark (Freake, 2008).

Finally, if assessment items could be re-used, more effort could be put into optimising the questions, the tutor notes and feedback, with improvements made in the light of experience. This would remove one of the barriers to more frequent presentation of the modules and to flexible study rates (since new assignments would not need to be produced for each presentation) and encourage the use of "little and often" assessment, for pacing (Gibbs & Simpson, 2004-05).

## Formative thresholded continuous assessment

In formative thresholded assessment, students are required to demonstrate engagement by meeting a modest threshold of some sort in the module's overall continuous assessment score (OCAS), but the student's overall grade is then determined on the strength overall examinable component score (OES) alone. The Science Faculty was given permission to move to formative thresholded assessment for all undergraduate modules at OU level 1<sup>1</sup> and for level 2 and 3 modules with an examination rather than an end-of-module assessment (EMA).

Two basic models of formative thresholded assessment are currently in use:

- Model A. Tutor-marked assignments (TMAs) and interactive computer-marked assignments (iCMAs) are weighted, and students are required to reach a threshold (usually 40%) overall;
- Model B. Students are required to demonstrate engagement by reaching a threshold (usually 30%) in, say, 5 out of 7 assignments.

Several of the modules included in the study use minor variants of the above, and there have been changes during the period of the investigation. Whilst, in general terms, such variation is to be discouraged because of the confusion caused to students, it has enabled useful comparison of some points of detail.

Formative thresholded assessment Model B was first introduced into two existing and two new level 3 physical science modules from 2010; *Analytical science* (S240) adopted a similar approach from 2012. Also from 2012, *Exploring science* (S104), *Introducing health sciences* (SDK125) and *Human biology* (SK277) moved to formative thresholded Model A, alongside the new module *Investigative and mathematical skills in science* (S141), and other modules followed from 2013. Level 2 and level 3 modules with end-of-module assessments rather than examinations have retained summative OCAS, as have modules nearing the end of their lifetimes.

## Evaluation methodology

Student opinion was canvassed prior to the introduction of formative thresholded assessment (Manners et al., 2008) and previous work had evaluated the introduction of purely formative iCMAs into a level 3 module (Bolton, 2010) and investigated student engagement with iCMAs in a range of modules, in formative, thresholded and summative use (Jordan, 2011).

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<sup>1</sup> OU levels 1, 2 and 3 are equivalent to Framework for Higher Education Qualifications levels 4, 5 and 6 and Scottish Credit and Qualifications Framework levels 7, 8, 9 and 10 respectively.

This paper summarises some of the outcomes of a major project which ran from 2012-14 with the aim of evaluating the Faculty-wide change in practice. In more detail, the research questions whose results are reported in this paper were:

- Has the move to formative thresholded assessment led to a change in TMA and iCMA submission rates?
- Has the move to formative thresholded assessment led to a change in TMA performance?
- Has the move to formative thresholded assessment led to a change in module completion and pass rates?
- What do students and associate lecturers know about and think of our assessment strategies?
- What are the relative merits of Model A and Model B formative thresholded assessment?

Other aspects of the evaluation, in response to the following research questions, are included in the final project report (Jordan et al., 2014) and will be disseminated elsewhere:

- Has the move to formative thresholded assessment led to a change in the extent or type of plagiarism cases that are detected?
- How do the levels of student engagement on iCMAs compare for summative, formative thresholded, and purely formative use?
- What is the impact of other assessment-related factors e.g. additional thresholds?
- What is the impact of other student-related factors e.g. do new students and continuing students perform differently? If students are studying two modules concurrently, what is the impact on TMA submission?

The evaluation of the change in practice was split into small practitioner-led sub-projects, comparing impact across different modules and levels, with the aim of identifying factors that lead to improved engagement. Sub-projects were both quantitative, e.g. comparing assignment completion rates before and after the change, and qualitative e.g. investigating student and tutor perceptions and opinion.

## **Summary of results**

The full results are given in full in the final project report (Jordan et al., 2014).

### ***TMA submissions, grades and overall completion and pass rates***

Year-on-year variation was difficult to interpret because of the many other changes that had place on the same time-scale as the study, in particular the changing student population as a result of HE funding changes in England. In order to allow for the impact of these factors, some results were verified by considering TMA submission only for those students who attempted the examination. Figure 1 compares the TMA submission rate for the October 2011 start (11J) and October 12 start (12J) presentation of *Introducing health sciences* (SDK125), on

which formative thresholded assessment had been used for the first time in 12J. The figure shows that submissions for the final TMA were slightly but not substantially reduced. On some other modules the drop in final TMA submission rate was more substantial, but the effect was not always present and the impact of other factors, in particular a cut-off date for a TMA (whether summative or formative thresholded) close to an examination date, had a considerably larger effect.

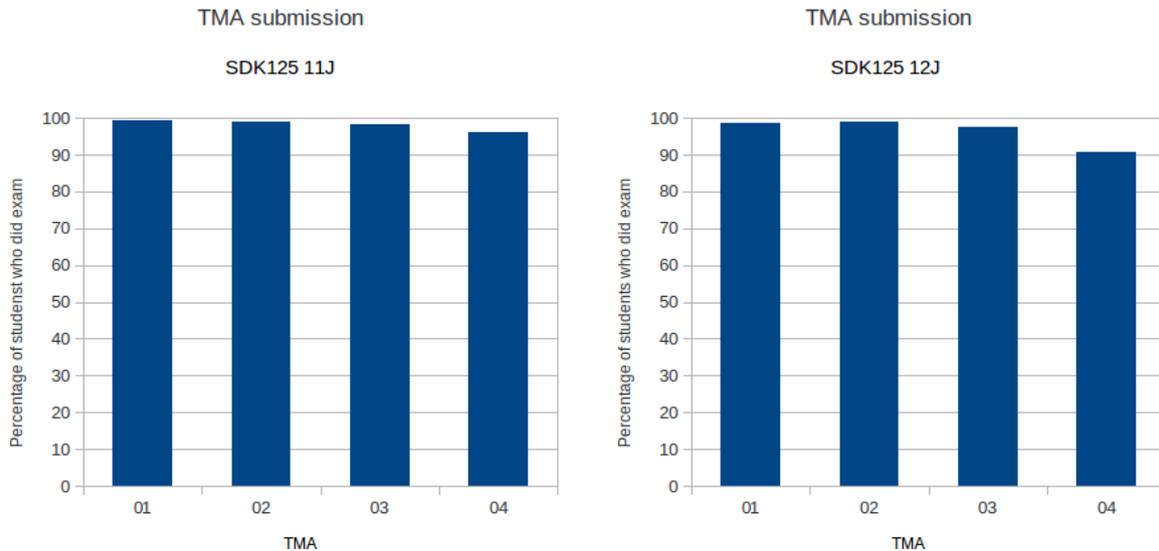


Figure 1. TMA submission rates for the 11J and 12J presentations of SDK125, for students who attempted the examination only (n = 630 for 11J and n = 574 for 12J)

Students were observed to be more likely to submit partial TMAs (measured by a proxy of scoring zero for one or more questions) in the final assignments of a module following the move to formative thresholded assessment (Table 1).

However, the most notable finding of this part of the evaluation was that there was no significant change in completion or success rates for any of the modules in the study as a result of the introduction of formative thresholded assessment. Other factors, for example, changing student populations, had considerably larger impact.

### **Correlations between TMA/iCMA submission and overall success**

Correlations between assignment submission and overall success were investigated in detail for seven modules and, unsurprisingly, strong correlations were found. For example, for students on the presentation of *Exploring science* (S104) that started in October 2012, those who submitted all TMAs had a mean exam score was 53.4 whilst those who did not submit all TMAs had a mean exam score of 44.4%. However correlation should not be taken to imply causality. Whilst, it is possible that the TMAs helped students to prepare for the final assessment, but it may simply have been that the students who were more able or who had more time for study were more likely both to submit all TMAs and to be more successful in the examination.

Table 1 Percentages of S104 students who scored zero for one or more questions in a TMA. Note that TMA07 was discontinued from the October 2012 presentation and an examination replaced the previous EMA.

<b>Oct 2011 presentation n =2109 at module start</b>		<b>Oct 2012 presentation n = 2357 at module start</b>	
TMA01	1.6%	TMA01	0.8%
TMA02	3.4%	TMA02	2.5%
TMA03	2.8%	TMA03	2.4%
TMA04	5.8%	TMA04	4.3%
TMA05	3.9%	TMA05	6.0%
TMA06	2.8%	TMA06	7.9%
TMA07	6.5%		

The submission of the final TMA (TMA04) for *Infectious disease and public health* (SK320) fell from 74% of registered students in 2012 (with summative OCAS) to 61% of registered students in 2013 (with formative thresholded OCAS, Model A); the mean score for this TMA for students who submitted it also fell from 73 to 69 between the two years, suggesting that some students may have put less effort into TMA04 following the change in assessment strategy. TMA04 was designed to prepare SK320 students for Part C of the final examination so this drop in engagement was a cause for concern. However, there was found to be at best a weak association between performance on TMA04 by students who submitted it in 2013 and their performance on Part C of the examination, and no association between non-submission of TMA04 and Part C score. It was therefore concluded that some students may have made a sensible decision in choosing to concentrate on revision rather than on submitting or gaining a high score in the final TMA.

### ***Student and staff perception of assessment strategies***

It is pleasing that some students have welcomed the change in assessment strategy, with one student on Human biology (SK277) commenting:

*Looking back on my previous courses I think I stressed over my TMAs far too much, perhaps to the detriment of revising throughout the year in preparation for the exam. I always wanted each TMA to be perfect... The reality for me has always been that my exam grade is the one which has determined by final grade. This year I am still working hard on my TMAs but I am not stressing about every tiny detail like I used to. I think I can actually say I am enjoying my TMAs.*

However, email dialogue with students and associate lecturers on several modules revealed a widespread and worrying misunderstanding as to the nature and purpose of assessment strategies, both formative thresholded and summative, with one experienced associate lecturer commenting:

*I don't think they do understand this – and I don't either. My experience on S104 was that in the previous model of summative continuous assessment the final mark was made up of both OCAS (75%) and OES marks (25%) – or at least that's what I thought... maybe I was wrong all those years, oops!*

Finally, there were pleas for more consistent practice, for example:

*I do work on other modules with a variety of different assessment strategies...I do wish there was consistency in assessment strategy style across the faculty, for me and for students.*

### **Potential impact of a change from Model A to Model B or vice versa**

For three level 2 modules *Analytical science* (S240), *The physical world* (S207) and *Human biology* (SK277), the impact of a change in threshold or a change from Model B to Model A or vice versa was investigated. Some students appear to have been strategic in their decision to omit assignments, for example one student only submitted one of SK277's TMAs, but scored 95 on it and thus passed the overall OCAS threshold. This student would not have passed either a 40% overall OCAS threshold or a "30% on 2 out of 3 TMAs" threshold, and obtained 54% in the exam, leading to a Grade 4 pass. Had the student been required to meet a more challenging OCAS threshold, they would presumably have submitted more TMAs, but it is not possible to tell whether this would have affected their final outcome. Another SK277 student scored 90% and 26% on two SK277 TMAs. They would not have passed either a 40% overall OCAs threshold or a "30% on 2 out of 3 TMAs" threshold, but they obtained 91% in the exam, leading to a distinction.

Other students were observed to score poor marks on assignments, and a fail or resit result whether or not they reached the OCAS threshold. For example, one student scored 40% on S207 CMA41, and 58%, 30%, 23%, 24%, 34% and 32% respectively on TMAs 01-06 respectively, leading to an OCAS of 37% which did not meet the threshold. This student only obtained 19% in the exam. Different thresholding may have led to a different OCAS result, but is unlikely to have affected the overall outcome.

### **Discussion, conclusions and suggestions for future work**

The change to formative thresholded assessment does not appear to have had any detrimental effect. However, many students and associate lecturers have a poor understanding of our assessment strategies, including conventional summative continuous assessment. This is in line with a frequently found result that students have poor understanding of the nature and function of assessment (Carless, 2006; Orsmond & Merry, 2011), perhaps because it has not been made clear (Surgenor, 2013). It is important that assessment strategies are clear and consistent across qualifications, and that they are explained carefully to students.

Whilst student motivation cannot be implied, it is possibly to see evidence that supports a notion of two contrasting groups of students who are in borderline OCAS categories: those

who do well on the minimum number of assignments but chose not to submit others and still do well on OES, and those who have a more modest performance on OCAS (perhaps just omitting one assignment) and fail the module as a result of their poor OES performance. Some students are probably best advised to spend their limited time on revision. Further qualitative work is required to ascertain students' reasons for behaving in the way that they have been observed to do.

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## **AN EXPLORATION OF TUTOR FEEDBACK ON ESSAYS AND DEVELOPMENT OF A FEEDBACK GUIDANCE TOOL**

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### **Introduction**

The provision of appropriate feedback on assessed work to students in higher education has long been a topic of concern, not least at The Open University, UK (OU). Although The OU has a reputation for excellence in the assignment feedback provided to students (Gibbs, 2010), ongoing experience of OU academics is that students do not always appear to be responding to, or even in some cases reading, the tutor feedback. As established by Hattie and Timperley (2007), an essential aspect of providing feedback is discovering how students have interpreted it. In the OU distance-learning context, students typically do not contact their tutors to discuss the feedback on their assignments and frequently tutors are working somewhat in the dark with respect to how their feedback is received. This paper discusses some of the challenges raised by this situation typically experienced within the OU distance-learning model and reports on an investigation of patterns of tutor feedback in the context of written assignments in a health and social care module.

A second stage of the project reported here is the testing of a tool or guide intended to support tutors to unpack the academic language surrounding feedback on academic writing. For example, what does it mean if an essay needs 'more depth' or a student's writing is 'too descriptive'? How can a student replicate 'good structure;' next time if it is not clear what they did well last time? The tool aimed to meet three outcomes for students: to understand the rationale for their marks; to know what to work on next time and how to do it; to feel empowered and motivated to take control of and continue their studies. It will discuss the issues raised by tutors' efforts to apply the guidance.

### **Background literature**

Recent studies of feedback on student assignments have highlighted retrospective feedback (feedback on the specific content and skills demanded by the assignment) outweighing that which is future-altering (feedback on generic skills and content), and also a deficiency in feedback on skills (Chetwynd & Dobbyn, 2011). It has been argued that such imbalances may impair students' chances to respond positively in developing their academic writing skills (Walker, 2009) as well as their broader learning strategies (Lizzio & Wilson, 2008). Walker (2009) also claimed that more attention needs to be paid to explanations accompanying tutor

feedback. Table 1 shows Chetwynd and Dobbyn's (2011) matrix indicating four main feedback domains: retrospective on content or skills, and future-altering on content or skills, which has been applied to tutor marking guidance on an OU technology course.

Table 1: A feedback matrix, from Chetwynd and Dobbyn (2011)

	<b>Retrospective</b>	<b>Future-altering</b>
Content		
Skills		

In addition to the technical and structural aspects of written feedback, there is also widespread recognition of the influence of the affective domain in feedback practices (Molloy et al., 2013; Carless, 2006). Emotions such as fear of failure or a sense of actual failure can interfere with a student's interpretation of feedback (Knight & Yorke, 2003), and awareness of this student vulnerability can also result in tutors delivering feedback designed to preserve a student's dignity (Molloy et al., 2013). Moreover, it has been established that 'first-year' students particularly need to be supported in the emotional aspects of learning, such as when receiving and interpreting assignment feedback (Poulos & Mahony, 2008). Barnett (2007) has offered further insights, suggesting that there is performance involved in the act of assignment writing. The 'performance' is two-fold: 'reaching out to an audience' (in the OU setting, this is the tutor) and the performance involved in using language to create academic arguments (Barnett, 2007, p79). Barnett also discusses the element of personal investment in academic work, proposing that submitting an assignment is an act of proffering a gift. His suggestion that students are vulnerable to fear of rebuke and criticism in response to the 'gift' of an essay provokes further reflection on the transactional nature of assessment. Alongside the emotional context of assignment writing, there is also potential for miscommunication between students and academics. For example, we cannot assume that students will understand the language that academics and tutors use in guidance on academic skills (Higgins et al., 2002).

## **The context of the study**

K101 'An introduction to health and social care' is a core introductory undergraduate module for the Faculty of Health & Social Care at The OU. As well as providing an overview of experiences and practices in health and social care and introducing theoretical concepts, K101 also has a role in developing study skills in a way that is accessible to a 'widening participation' audience. Additionally, K101 is an integral part of The OU's social work degree, in which the professional body mandates that all tutors provide feedback to students on the standard of writing in their assignments. During a project aimed at providing targeted writing development support for K101 students who were particularly challenged by academic essay writing, it became apparent that the technical aspects of essay writing could not be separated from students' personal struggles to understand the content of the module, the expectations of assessed work, and what it means to study at HE level.

We realised that K101 students might not always understand or be able to respond appropriately to the written feedback. It became clear that there was a chain of communication events, each of which was vulnerable to misinterpretation, from the intentions of the academic writing the question, the student guidance and tutor marking guidance, the diverse understandings of the genre of essays in HSC and what constituted a good essay writing style. Small-scale investigations of the student experiences of writing essays and tutor experience of supporting essay writing at the OU (e.g. Donohue & Coffin, 2012), indicated that students and academics or tutors could potentially make very different sense of the requirements of an essay task.

In 2011/12 the introduction of self-reflective questions in two K101 tutor-marked assignments (TMAs), aimed at encouraging students to engage with their tutors' feedback and reflect their responses back to the tutor, provided an opportunity to evaluate an aspect of the student-tutor dynamic within this process. The questions, included in TMA 02 and TMA 07, focused on students' perceptions of how they had responded to their tutor's feedback. In both TMAs, students were asked to give very short answers to the questions 'What aspects of your tutor's advice from previous feedback have you tried to use in this assignment?', 'What have you found most difficult about this TMA?' and in TMA07 only, 'How do you view your progress since you started K101?' The focus of the first part of this paper is on the observable distance-tuition interface between student and tutor. It analyses the tutor feedback and the insights students reflected back to their tutors. The second part of the paper summarises a pilot implementation of a tool to facilitate structured explicit and meaningful feedback in K101.

## **Stage 1: exploring feedback practices and explicit student responses**

### ***Aims***

This stage aimed to evaluate the relationship between tutor feedback on student essays and student responses to the self-reflective questions. Trends in retrospective and future-oriented feedback, and content and skills feedback were explored during the course. Additionally, the relationship between tutor feedback and student's responses to the feedback documented in their self-reflective notes was evaluated.

### ***Methods***

In this longitudinal observational survey, samples of tutor feedback summaries were systematically analysed for 'content and skills' content and their retrospective or future-altering orientations (Chetwynd & Dobbyn, 2011). In addition, student responses corresponding to their tutor's feedback were analysed according to the content or skills orientation. Taking Chetwynd and Dobbyn's (2011) matrix as a starting point, the 'skills' element was further subdivided to take account of the range of writing skills being developed in the course and the clear distinctions being made by the tutors in their feedback. It should be noted that tutors also provided comments on the script, but these were not included in the

study. The final matrix for analysing tutor and student feedback applied seven skill categories, with ‘content’ as the eighth category (see Table 2).

Table 2: Matrix of content and skills categories for feedback analysis

<b>Content and skills</b>	<b>Tutor retrospective (focused on the marked essay)</b>	<b>Tutor future-oriented (framed as work for future assignments)</b>	<b>Student S-R notes</b>
<b>Study skills:</b> self-organisation, study strategies, providing a word count (as good academic practice), signposting to/offering further resources or support			
<b>Referencing:</b> all referencing skills			
<b>Cognitive skills:</b> ways of handling content – interpreting/answering the question, defining terms, using concepts, and developing an argument			
<b>Content:</b> use of evidence and course materials			
<b>Style:</b> flow, signposting, clarity (beyond basic grammar issues), word contractions, and ‘voice’ (such as use of first person)			
<b>Structure:</b> organisation of the essay, word count (whether the appropriate length), and paragraphing			
<b>Grammar and spelling:</b> sentence construction and spelling			
<b>Presentation:</b> layout and choice of font			

### **Sampling**

Electronic tutor-marked assignments (eTMAs) were sampled by hand via the eTMA monitoring system, which itself randomly selected marked scripts for quality assurance monitoring. An initial sample of 52 students became depleted, due to some not submitting self-reflective notes, not downloading feedback, or ceasing to submit TMAs. The final sample of 25 students (about 1 ½ per cent of course completers), each with different tutors, provided a complete data set for the purposes of the study. In total, the data comprised 125 samples of tutor feedback on five essays per student/tutor pair, and 50 samples of student self-reflective notes. Although there were seven TMAs altogether, TMA05 was omitted from the study because it was based on a team project rather than material related to the course content.

### **Selecting and coding the data**

The text of the tutor feedback was coded according to the eight content and skills elements and further differentiated into retrospective and future-oriented feedback (see Figure 2). The detailed attributes of the skills categories were developed inductively through working with the samples. The categories of students’ reflective notes were similarly documented. ‘Cases’

were created to map the ‘feedback journey’ of individual students and to determine any relationship between tutor feedback and the student’s reflections.

### **Findings**

Some tutors had separated their retrospective and forward-feeding feedback on the page. In other cases, tutors had combined retrospective and future-oriented feedback into one sentence or paragraph. Retrospective tutor feedback mostly outweighed future-oriented feedback, particularly for cognitive skills and content. Figure 1 gives an example of the number of tutors using particular categories, showing the prevalence of retrospective feedback for the two feedback categories ‘content’ and ‘cognitive skills’. The most popular category for students was referencing, closely followed by study skills and cognitive skills (see Figure 2). Some of these elements are likely to have been in response to tutor input beyond the TMA feedback summaries.

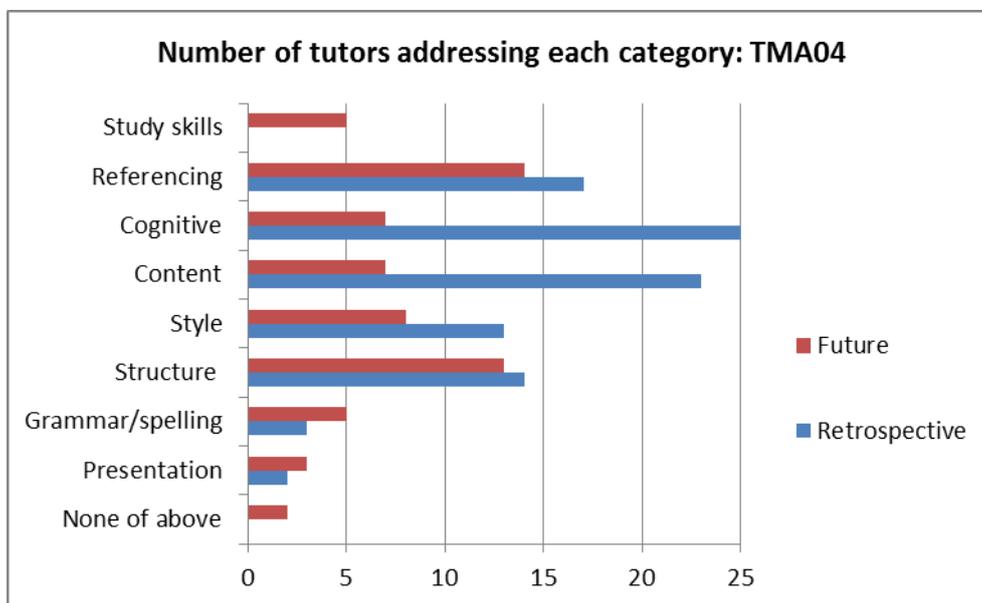


Figure 1. Number of tutors (max 25) referring to the designated categories: TMA04

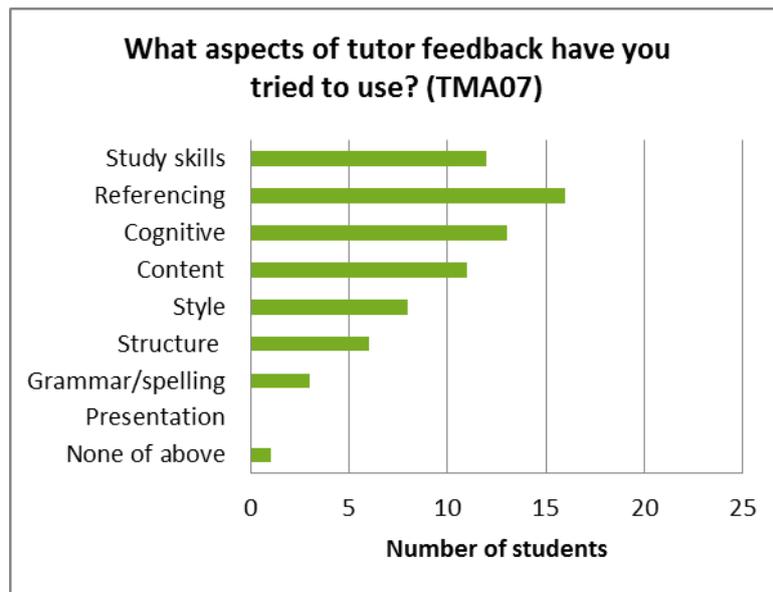


Figure 2. Number of students (max 25) referring to the designated categories

The following two examples of ‘cases’ show differing patterns of tutor feedback and student responses in their self-reflective notes. They give some indication of the range of feedback patterns observed in the sample through plotting the categories of feedback observed in individual student-tutor cases. In addition to these observations of feedback categories, it was also apparent in the majority of cases that there was scope for increasing the clarity of feedback summaries through improving the structure and by unpacking the jargon. For example, what does it mean if an essay needs ‘more depth’ or a student’s writing is ‘too descriptive’? How can a student replicate ‘good structure;’ next time if it is not clear what exactly was good about the structure last time? In addition to this, it seemed judicious to offer tutors further guidance on how to develop more future-oriented feedback, even though retrospective feedback also appeared to have a future-altering impact (see Figure 4).

Category	TMA01	TMA02	TMA03	TMA04	TMA06	SR
Study skills						
Referencing						
Cognitive	r	r	r	r	r	r
Content	f	f	f	f	f	f
Style						
Structure						
Grammar and spelling						
Presentation						
None of above						
	r	f	SR	r	f	r
	f	SR	r	f	r	f
	SR	r	f	r	f	SR

Figure 3. Student whose writing did not progress smoothly, yet who seemed to recognise the need to develop cognitive skills (r = retrospective tutor feedback; f = future-oriented feedback; SR = student self-reflective notes after TMA01 and 06)

◆	◆			◆				◆	Study skills		
◆				◆				◆	Referencing		
◆	◆		◆			◆		◆	Cognitive		
	◆			◆		◆		◆	Content		
◆	◆					◆		◆	Style		
◆	◆	◆	◆			◆	◆	◆	Structure		
									Grammar and spelling		
		◆							Presentation		
					◆	◆			None of above		
r	f	SR	r	f	r	f	r	f	SR		
TMA01			TMA02		TMA03		TMA04		TMA06		

Figure 4. Student who made good progress and seemed to respond well to retrospective feedback (r = retrospective tutor feedback; f = future-oriented feedback; SR = student self-reflective notes after TMA01 and 06)

## Stage 2: developing a tutor feedback tool

A feedback tool, which focused on the tutor’s feedback summary, was developed following the analysis of tutor feedback and the corresponding student self-reflective notes reported here. A list of ten principles was proposed, driven by a desire to meet three outcomes for students: to understand the rationale for their marks; to know what to work on next time and how to do it; to feel empowered and motivated to take control of and continue their studies. Space on the feedback forms was premium, and tutors were requested to steer away from complicated sentence padding such as ‘You do evidence your ability to...’ or ‘You do need to focus on ensuring that...’. The tool also specified a consistent structure and urged tutors to double-check their own spelling and sentence construction. The recommended feedback sequence comprised: motivational opening, retrospective feedback on strengths, retrospective feedback on weaknesses, and future-oriented feedback on how to develop skills in future work.

### Principles

The feedback summary should:

1. Be clearly structured, and written in clear, simple language.
2. Contain a prominent motivational element.
3. Be appropriate for the stage of the student journey.
4. Be meaningful to each individual student.
5. Signpost to script comments where appropriate.
6. Include ‘retrospective’ feedback on the submitted work: strengths and weaknesses.
7. Include ‘future-oriented’ feedback.
8. Provide feedback on both content and skills.
9. Flag appropriate events and/or resources.
10. Make the implications clear if a student is failing.

The bulk of the document featured examples of wording for the feedback summary, for example, ‘you showed your understanding of the question partly by defining the important terms’, or ‘I was just able to follow how one point/idea/topic led to another’. Future-oriented feedback included: ‘Try to adopt a more formal writing style, by bringing in more of the specialist language and the concepts discussed in the module’, and ‘When you plan your essay, try linking some K101 source material (e.g. video, a resource, or discussion in the Block) to each part’.

The tool was piloted in 2013/14 and feedback gathered from nine tutor volunteers. All pilot tutors willingly embraced the principles and adjusted their feedback practice to varying degrees. I would like to share the feedback and the subsequent adjustments made to the feedback tool at the EDEN workshop, along with further discussion of links to the relevant literature.

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## **ASSESSING ORAL PRESENTATIONS IN DISTANCE AND OPEN LEARNING**

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In light of the predominance of written communication skills in distance learning settings, there is a need to extend and improve opportunities for distance learning students to practice, develop and demonstrate their oral communication skills. Sophisticated oral communication skills are valued as important graduate skills within many academic disciplines and subject areas (HEA, 2009, p. 13). They are recognised as significant transferable skills with clear links to employability (Race, 1995). Indeed ‘most careers require [oral] communication skills; some require them far more than the kind of written skills fostered through written exams and essay assessments’ (HEA, n.d.). Furthermore, studies have shown that ‘oral presentations also promote other personal skills, such as self-confidence’ (HEA, n.d.). Joughin (1999) and Race (1995) highlight the potential impact of oral forms of assessment on students’ approaches to learning. Joughin argues, for example, that oral forms of assessment encourage deep approaches to learning that are focused on understanding, rather on than merely coping with the demands of the module or on the intention to achieve high grades (Joughin, 1999, p.151). It is also widely recognised that the diversification of methods of assessment leads to fairer, more reliable assessment of students as they can be rewarded for a broader range of skills and aptitudes (van der Vleuten, 2014; Race, 2005; HEA, n.d.). From this point of view, the assessment of oral presentations can provide ‘rewarding opportunities for students who believe they have an aptitude for oral expression and communication [...and...] work to refine those skills’ (HEA, n.d.).

While digital technology has created new opportunities to practice and assess a wider range of communication skills, including oral communication skills, the benefits and challenges of the use of digital tools for assessment purposes in HE requires further investigation and critical evaluation (Sinclair, 2011; Sinclair, 2013; Vonderwell & Boboc, 2013, p.22). This paper relates to the workshop themes of ‘Researching Learning Design’, ‘Researching 21<sup>st</sup> century skills and the role of ODL in up-skilling students’ and ‘Open and Distance Learning for Employability’. It critically engages with the findings of a research project I conducted between October 2013 and July 2014 on ‘Assessing oral presentations in distance learning’, funded by a Higher Education Academy (HEA) Individual Teaching Development grant. This research project investigates the benefits, challenges and wider applicability of a form of assessment that requires students to digitally record an oral presentation and submit it electronically as an audio file. This paper considers what this research reveals about students’ perceptions of the experience of delivering, recording and receiving feedback on a oral presentation given to a

virtual audience in an asynchronous setting. It also investigates tutors' views on the benefits and challenges of providing effective feedback on oral presentations in distance and open learning settings.

## **Methodology**

My research project focused on an assessment task that forms part of the OU Religious Studies module A332 *Why is religion controversial?* A332 was presented for the first time in October 2013 to June 2014. It is the first module in the OU Arts Faculty that includes an oral presentation in its assessment strategy, though there are two further new modules in Philosophy and Classical Studies (A340 and A333) that are planning to introduce this form of assessment. There has been great interest in the OU Arts Faculty in the wider application of this form of assessment. In my role a lecturer in Religious Studies, author of module materials, module team member and co-chair, I have been involved in the production and presentation of A332 and in the design of assessment tasks. I was also one of the 21 tutors who taught this module during its first presentation.

The assignment in question is the second of five tutor marked assignments that form part of the module's overall continuous assessment score (OCAS) and is divided into two parts. Part 1 consists of a 1,500 word essay based on a close-reading exercise, which requires students to answer a question in relation to a specified extract from an academic text. Students are also asked to append a list of at least three bullet points indicating the main points of their essay. The focus of this project was on Part 2 of this assignment, which requires students to digitally record a 3 minute audio presentation and submit it electronically as an audio file. Students were asked to base this presentation around the argument of the essay they wrote in response to Part 1, with specific reference to the main points they appended to it. They were advised to envisage an audience of fellow students who have not taken this module and have general knowledge of some of the issues involved, but are no experts in this specific area. An alternative format of assessment, which involved the submission of a written script for an oral presentation, was offered to students who were unable to communicate orally, but not to students who were not willing to deliver an oral presentation or could not submit an oral presentation because of technical difficulties. In the assessment of TMA02, the essay-based task submitted for part 1 was given a 75% weighting, while the oral presentation submitted for part 2 contributed 25% of the overall grade for TMA02. (TMA02 made up 20% of the OCAS.)

The initial phase of the project involved the design and distribution of two online surveys, one for students and another for tutors. Both questionnaires included a mixture of open and closed questions (Brewer, 2003; Cottrell, 2008; O'Leary & Dowds, 2003) and were distributed via the Qualtrics system used by the OU's Institute for Educational Technology's Student Statistics and Survey team. The student questionnaire aimed to establish how students perceive the experience and associated learning outcomes of delivering, recording and receiving feedback on a presentation given to a virtual audience in an asynchronous setting. The tutor questionnaire aimed to establish tutors' views on the benefits and challenges of

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providing effective feedback on oral presentations from a distance. 303 students were invited to take the survey and 135 students responded (4 of which only partially completed the survey), giving a 43.6% response rate based on complete responses. Out of these, 126 students had submitted the presentation task, 4 had completed the alternative assignment task and 5 had not completed this task. 21 tutors were invited to take part in the survey by email and 17 questionnaires were completed, giving an 80.6% response rate based on complete responses.

In addition to the 19 assignments from students in my own tutor group that I marked in my role as tutor and 9 assignments that I monitored as part of my role as a module team member, I listened to 21 samples of the submitted oral presentations and read the related tutor feedback, looking for common themes and issues in the ways students approached this assignment task and the ways tutors assessed and provided feedback on it. I listened to 7 examples of audio presentations (and read the related feedback from tutors on these assignments) where that were scored highly by their tutors, 7 that received medium scores and 7 that were scored low.

Based on the findings of this research, I developed a toolkit with accessible guidance on good practice in assessment design and the provision of feedback on oral presentations in distance learning settings. All tutors and students from four tutor groups were invited to comment (either on the online forum or by e-mail) on a draft of this toolkit. A draft of this toolkit was posted on the modules' tutor forum (located on the A332 Tutor only website) and on four student group forums, and students and tutors were invited to comment either on the relevant forum strands or by e-mail. The findings of this project (including the toolkit) were also presented and discussed at the face-to-face tutor briefing after the completion of the first presentation of the module. The toolkit was revised in light of the comments and will soon be made publically available as a resource on the HEA website.

### **Project Findings**

The most prominent issues students raised in the survey concerned technical difficulties, either related to downloading the relevant software or zipping the audio file together with the word processed file from the essay and to submit both as a single file via the electronic assignment system. Some students reported incompatibilities of the OU's in-house audio recording tool (ART) with MAC computers or with different browsers. While ART has been used extensively within the context of modern foreign language modules in the OU, it was new to students from the Arts Faculty. However, students were not limited to using ART and could use alternatives. Detailed technical advice had been provided in the guidance notes for this assignment and further technical support was available to students via the OU Computing helpdesk. 60.1% of respondents found the technical guidance notes either 'helpful' or 'very helpful', but 27.6% did not find them helpful (which is an alarmingly high proportion) and 1.6% admitted that they had not read them. Four of the five students, who responded to the survey, but had not completed this part of the assignment, reported that they had not submitted a recording of an oral presentation because they felt daunted by or put off by the

technical requirements. One of these students explained, for example: 'My interest was in religion and not in whether or not I could successfully operate computer/software'. The project findings highlight the need to use technology that is as user-friendly and accessible as possible. Some of the technical issues that students encountered during the first presentation of A332 should hopefully be addressed in future presentations through the introduction of a new version of ART, which does not require students to download Java and is compatible with a wider range of browsers and software. The project findings also suggest that it is a good idea to find ways of encouraging students to familiarise themselves with the different technical aspects and check that their software is working in a less pressured environment well in advance of the assignment deadline. For the next presentation of A332, we have added a new online activity which encourages students to use the audio recording tool several weeks before the assignment deadline and record a three-minute oral response to an activity. This activity also helps students to get a better feel for how much can be said in three minutes and get used to the sound of a recording of their own voice and practice their presentation skills. In future presentations of A332, students will also be encouraged to practice the electronic submission of a zipped file as part of a 'dummy' assignment in the first week of the module. This way, the acquisition of different technical skills are gradually spaced out and practiced over several weeks in advance of the deadline.

The fact that the OU's student body is particularly diverse means that students bring a very different range of prior experiences to their studies. While 34.1% described themselves either as 'very experienced' or 'experienced' in the delivery of oral presentations (primarily due to their previous or current work experience), a large proportion of students (47.6%) had very little or no prior experience of giving oral presentations. Inexperienced students in particular need advice on presentation skills and opportunities to practice them before the assignment. This highlights the need to prepare both staff and students in the development of their presentation skills and assessment literacy - it should not be assumed that they already 'know' how to give an oral presentation or how to assess it. In the case of A332, the guidance notes for both students and teachers were revised and clarified in light of the project findings and links to relevant study skills resources on 'Giving presentations' from the *Skills for OU Study* pages were provided (The Open University, 2013). We also recorded a study skills podcast where students from my own tutor group talk about their experiences of completing this form of assessment (in a reassuring way) and give some practical advice. This podcast will be made available to students on future presentations of A332 on the module website. It will also be made available to other students on other modules in the OU Arts Faculty that are introducing this form of assignment.

In order to alleviate students' anxieties around this form of assessment – particularly if it is new to them – it is also helpful if it is given a relatively low weighting. Ideally, this form of assessment should be repeated to support students in developing their presentation skills based on their tutor's feedback (and 'feed forward') and in building their confidence. This insight is supported by a recent HEA report on 'Diversifying Assessment', based on a study of undergraduate modules in the history of science, which comes to the conclusion that 'The

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formative experiences derived from first attempts at presentations reduce anxiety and improve performance in subsequent attempts' (HEA, n.d.). This resonates with comments students made in the context of the survey, stating, for example:

*'Like some other students on the course, I was initially nervous, however, it really wasn't as bad as it seemed and has given me back the confidence to engage in this kind of activity again.'*

However, given that within the context of open and distance learning, the predominant form of tutor feedback and 'feed forward' is provided as part of tutor marked assignments, it might be problematic to include several oral presentations in the assessment strategy within the confines of a single module.

Another challenge arose out of the fact that although many OU tutors are very experienced in supporting distance learning, some had relatively little or no experience of assessing oral presentations, and for many of those tutors, who were experienced in assessing oral presentations through their work at other HE institutions, this experience was often limited to face-to-face settings. In their survey responses, tutors raised a range of challenges of assessing presentations at a distance, highlighting, for example, that 'there is no personal interaction, not clues of body language'. However, other tutors felt that hearing their students' voices helped them establish a more personal connection and even suggested providing oral feedback:

*'distance learning can become very impersonal, especially if students do not attend face-to-face tutorials. Having an oral presentation creates a more personal connection at least from my end! Perhaps my evaluation should also be oral.'*

The fact that the audio presentations were recorded and were relatively short meant that tutors could listen to them several times or go back to a particular point in a presentation for clarification. About a third of tutors, who responded to the survey, said that they listened at least twice to every presentation. The fact that the presentations were recorded also allowed students to listen to their own presentations. These are clear benefit in comparison to the transient nature of face-to-face presentations in live settings (Race, 2005). Even though the module team had provided tutors with marking guidance, relating to both, content and presentation skills, the analysis of feedback samples revealed considerable discrepancies in the amount and quality of feedback (and 'feed forward') tutors provided, in particular in relation to the relative weighting of presentation skills and content. This confirms Pickford and Brown's observation that while there is general acceptance that oral presentations should form part of assessment in HE, there is often confusion around what is actually being assessed (Pickford & Brown, 2006, p.59). Pickford and Brown highlight the need for a systematic approach and come to the conclusion that 'the most important success factor in the assessment of oral presentation skills is the specification and communication of clear assessment criteria' (p.62). This concerns clarity about 'the relative weighting of content and

delivery' and about the intended outcome or purpose of the presentation (Pickford & Brown, 2006, p.62; see also Race, 1995). Module teams within the OU context not only face the challenge of developing clear assessment criteria, but to convey them effectively to the team of tutors who are teaching and assessing the module. This highlights the need for careful preparation and ongoing support and dialogue between the module team and the tutors, for example in the form of improved marking guidance, briefings and staff development and moderation activities, particularly if tutors or module teams are new to this form of assessment.

Another challenge that was mentioned by both students and tutors in the surveys was the artificiality of the experience of delivering or assessing an asynchronous oral presentation at a distance to a virtual audience. In their responses to the online survey, students argued, for example, that 'Making a presentation without an audience is somewhat false', or that 'Face-to-face presentations allow you to bounce off the reaction from the audience and to gauge understanding and enjoyment. That is not possible with an imagined audience'. Given that a vast majority of 83.9% of the students, who responded to the survey, felt that giving a presentation to a virtual audience was 'not very similar' or 'completely different' to giving a presentation to a live, face-to-face audience, to the extent this form of assessment actually does equip students with transferable employability skills needs to be questioned. However, it could be argued that a short, digitally recorded presentation (comparable to a podcast) prepares students better for a world where 'more and more oral communication is at a distance, supported via the Internet, mobile communications technologies, video conferencing and multimedia presentations' (Pickford & Brown, 2006, p.61) and can play an important role in the development of 21<sup>st</sup> century skills. From this point of view, all HE institutions – not just those with a specific focus on distance learning – need to think about new ways of developing and assessing students' oral communication skills that go beyond the traditional face-to-face setting and utilise different kinds of communication technologies (p.61).

Only a very small minority of 4.9% of students, who responded to the survey, indicated that they would have preferred a video to an audio presentation. The question of how helpful they would have found the submission of PowerPoint slides received a very mixed response, with 30.6 % of students indicating that they would have found this option 'very helpful' or 'helpful' and with 43.3% indicating that they would have found this option either 'unhelpful' or 'not at all helpful' (26% had 'no opinion' on this matter). However, a considerable majority of 70.8% found the requirement to base the presentation on at least three written bullet points (submitted as part of this assignment) either 'very helpful' or 'helpful'.

Some students stated that they regarded the absence of an immediate audience as a helpful stepping stone in overcoming 'stage fright' and in building their confidence in their presentation skills. They reported that they found it 'less nerve wrecking' than delivering a presentation to a live audience. A student commented, for example: 'You can't see the people in front of you, so you feel more free to express yourself in a more open way'. While some students developed coping strategies, such as asking family members to act as the audience, others struggled with the process, as the following comment by a student reveals: 'I scripted it

with the audience as detailed in the guidance notes in mind but have to admit that I couldn't envisage them when actually delivering it.' As Ong (2012, p.174) points out in his seminal exploration of the relationship between orality and literacy, the difficulty of envisaging an audience is not unique to the delivery of oral presentations at a distance:

*'The written text appears prima facie to be a one way informational street, for no real recipient (reader, hearer) is present when the text comes into being. But in speaking as in writing, some recipient must be present, or there can be no text produced: so isolated from real persons, the writer conjures up a fictional person or persons. [...] The fictionalizing of readers is what makes writing so difficult. The process is complex and fraught with uncertainties.'*

This means that the development of coping strategies that deal with the 'fraud' and 'uncertain' nature of an imagined or fictionalised audience can feed into the development of both written and oral communication skills. In fact, it could be argued that issues related to the fictionalisation of an audience can be raised and addressed more explicitly in the context of a digitally recorded oral presentation as the absence of an immediate audience is more keenly felt than in the context of a written assignment. The connection between oral and written communication skills and the benefits of 'what talking can do for academic writing' (Thompson, 2014) has been extensively explored by Elbow (2012). He argues that 'even serious, formal and "literate" writing can be even more careful and better, paradoxically enough, if it enlists various resources of careless speech' (pp.4f.). Though Elbow's work predominantly focuses on the benefits of 'unplanned, careless, spontaneous spoken language' (p.9), rather than relatively formal oral presentations, my project findings highlight the benefits of engaging different sensory modalities or physical media in the development of students' communication skills. A vast majority of 91.1% of students confirmed that they found the fact that there was a close link between the topics of the written essay and the spoken presentation 'very helpful' or 'helpful'. As the following quote from a student's response to the survey illustrates, some students explicitly stated that approaching a similar task through different media helped deepen their learning experience:

*'A benefit was that when I first did the sound recording [...], I discovered I'd missed an important point to be made in the essay conclusion.'*

This was echoed in a number of comments by other students who felt that their oral presentation for part 2 helped them with writing the essay for part 1.

Though there is clear evidence supporting the benefits of approaching the same or a similar topic through different media, the project findings also highlight the need for a clear rationale distinguishing both assessment tasks. The analysis of survey responses and assignment and feedback samples indicate some confusion amongst both, A332 students and tutors, around the difference between the content and purpose of the written essay and those of the oral presentation. One of the main differences (intended as part of the assessment design) concerned the target audience and the fact that the guidance notes asked students to envisage

a broader audience for the oral presentation than for the essay, i.e. an audience of fellow students who have not taken this module and have a general knowledge of some of the issues involved, but are not experts on this specific area. However, when questioned what kind of audience they actually envisaged, only half of the students, who took part in the survey, identified this particular type of audience. In order to address this issue, the assessment guidance notes were expanded and clarified for future presentations to emphasise the importance of the target audience and specific purpose of this oral presentation. Some further explanatory notes have also been added that outlined the main skills required for presenting to a broader audience and highlight the benefits and professional and practical relevance of the development of these skills.

## **Conclusions**

The project findings highlight the many challenges of using a digitally recorded audio presentation as part of assessment in the context of open and distance learning. These challenges include technical difficulties, the different levels of prior experience that students and tutors bring to the delivery and assessment of oral presentations (which are particularly diverse in open learning settings), the difficulties of designing clear assessment criteria and the challenges associated with communicating them to tutors and students, the ‘artificiality’ linked to the physical absence of the audience at the point of presentation and the challenges of the physical absence of the presenter at the point of assessment. In the case of the OU module at the centre of this study (A332), the design of this particular assessment task clearly required some further adjustments as well as the production of further resources in light of the project findings. However, on balance, it seems that the benefits of using this form of assessment outweigh the challenges. These benefits include the development of 21<sup>st</sup> century graduate skills with clear links to employability. As a tutor put it in response to the survey, this form of assignment can help students ‘find a “voice” that is both academic and engages a broader audience’. One of the most striking findings of this project has been the mutually beneficial relationship of the development of oral and written communication skills which can enable deep, effective learning experiences. However, the challenge of conveying these benefits effectively to staff and students remains.

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## **EXPLORING QUALITY IN TEACHING AND LEARNING WITH ICT: A QUALITATIVE STUDY**

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### **Introduction**

ICT in education is often associated with increased opportunities for flexibility, efficiency and availability. Technology can for example make education available to students that are unable to move from their homes or commute to HEIs; and to save time and resources in administration and communication activities. Such arguments have often dominated when ICT in education has been on the agenda (Norwegian Ministry of Education, 2013; Selwyn, 2011). Moreover, the importance of providing students with education relevant for living and working in a modern technology-rich society. However, ICT in education also means that different technologies, media and resources that are increasingly used in higher education.

The purpose of this qualitative study was to explore lecturers and students' experiences with and opinions on the use of ICT in teaching and learning activities. The key issue in this work was to explore on how ICT contributes to the quality of teaching and learning. To achieve this, we interviewed students and teachers at campus based educational programmes and online educational programmes in various fields and disciplines.

### **Review of previous research**

In the research literature, digitally competent teachers are characterized by their ability to draw upon multiple areas of knowledge; teaching skills, expertise on ICT and didactic skills are often highlighted in this case (e.g. Mishra & Koehler, 2006; Koehler, Mishra & Yahya, 2007; Voogt et al. 2012). Teachers must master the basic technological skills, like being able to make use of presentation programs, audio and video, communicate via digital learning platforms etc. Another important dimension is that teachers must have sufficient self-confidence and sense of achievement to be able to use ICT and integrate this seamlessly in their own teaching practice. Far from all teachers master this, and teachers face many barriers in this process. Prestige (2012) distinguishes for example between what she calls “first order barriers” and “second-order barriers.” “First order barriers” are characterised as access to the necessary technological infrastructure, hardware, software and the like, competence in teaching with and through ICT and especially access to adequate digital learning resources. What Prestige referred to as the “Second order barriers” are more complex challenges, related

to teachers' self-esteem and their confidence in applying ICT in their own teaching. Prestige found that confidence and sense of achievement, in itself, was not enough for teachers to practice 'digital pedagogy', i.e. seamless use of ICT in teaching and learning activities where students also contributed as active producers of digital content. ICT involves many different forms of technology, media and tools that teachers and students can use in teaching and learning. Other researchers have identified aspects of excellence in all kinds of teaching with ICT, not only those related to the teaching context, such as campus or online (Janzen, Perry & Edwards, 2011). They also agree that teaching excellence uniquely connected with online teaching differ in various ways from campus based teaching (ibid).

At European level, the European Foundation for Quality in E-learning, EFQUEL, has developed a framework to define the characteristics of quality in the educational use of ICT/e-learning in higher education, (EFQUEL, 2011). The framework includes three main criteria; learning resources, learning and teaching processes and context (ibid.). In our study, we have applied these criteria in order to structure and analyse our findings. In this, learning resources will include digital learning resources, both videotaped lectures as well as others. Learning processes will include teaching and learning with ICT; and the learning contexts include several levels; organizational conditions, such as infrastructure, expertise and location (campus/onsite or online).

## **Methods**

The study is based on qualitative methods. Such an approach enables us to carry out an in-depth study of the various issues related to quality of education. There are two main groups of informants; lecturers and students. Our approach is based on a case study-design, each institution of higher education visited represents one case. A case study approach can involve several approaches. Thomas (2011) defines case study that analyse people, events, decisions, project periods, policy fields, institution or system, illuminated from a holistic approach through one or more methods. In this way stands the case itself as being the centre for the study and this again requires an analytical framework to illustrate and explain the findings that may arise.

In our study, at each of the institutions visited, we conducted focus group interviews lecturers and students. In total, we conducted eight case / institution visits. The intention is that our selection of cases will tell us something about the breadth of opinions, attitudes, actual use of ICT in higher education and perceptions of what digital literacy means. We wanted, as far as possible, to capture some of the diversity within higher education by including a variety of educational institutions. In the selection, we have included colleges and universities, professional education and university programs, different disciplines, geographic variation, large and small institutions (in terms of number of students). In addition, we wanted to include lecturers and students involved in online education. Students in online education were interviewed while attending gatherings on campus.

The criteria used to ensure diversity can be summed up as follows:

- University/university college;
- Professional education / educational programs;
- Areas;
- Large and small institutions (number of students);
- Campus based / online study;
- Geographical diversification.

Informants, both teachers and students at each of the selected institutions affiliated to the same selected education program at the institutions. Teachers were selected due to their experience in educational use of different technologies.

At each institution we interviewed lecturers and students through focus group interviews. The focus group interview differs from the traditional group interview, in that participants converse with each other, rather than with the researcher. The researcher functions more as a facilitator than an equal participant in a dialogue. Focus group interviews, can be an efficient way of gathering data from several people at the same time in the form of semi-structured group discussions with a smaller sample of a population (Notnæs, 2001). Each focus group included between five to seven participants. It is in their nature that focus group interviews cannot be anonymous. The data arises as several people discuss and compare their experiences and interpretations during the interview. Experiences and quotes from focus group interviews have been reproduced without using names of people who speak out. Instead we write as “teacher” or “student”. An interview guide was developed in advance of the interviews; this worked primarily as a reminder during the interviews to ensure that the same topics and issues were included in all interviews. The interview guide included topics such as teaching with ICT, learning with ICT, communication and information through ICT and contextual conditions for teaching using ICT. Each interview was recorded as audio file, based on the consent of the interviewees. A short summary note, which included the essence of the interview, was produced from each interview. Our treatment of personal data was approved, in advance, by the Norwegian Social Science Data Services (NSD) and we followed their guidelines for good research practice.

## **Findings**

Following the structure from the EFQUEL as previously introduced; our analysis is concentrated on three main areas: learning processes, learning resources and learning contexts.

### ***Learning processes; teachers and digital literacy***

Teachers interviewed in this study were all experienced with teaching with various technologies. Teachers without such experience are not included in the study. Still, we found that the teachers interviewed had different approaches to, and understandings of why they actually use digital tools and media for teaching and learning purposes. Teachers also

demonstrated diversity on their perceptions of teaching practices with different technology. Where some teachers talked about a kind of tool-based approach to digital resources and media, others were clearly keen to see how different technologies and digital resources supported the educational processes.

Another important dimension related to teachers' digital literacy from the research literature, is that teachers must have sufficient self-confidence and sense of achievement to be able to use ICT and integrate this seamlessly in their own teaching practice (Prestige, 2012). All the teachers we have been in contact with seem to have access to basic technology and adequate learning resources. Nonetheless, not all teachers managed to get students to contribute to their own learning by being active producers of digital content. We also identified teachers who were more likely to be "tool-oriented" in the way they applied ICT in teaching, they were more likely to pick a technology for a certain purpose without the seamless embedding of content, pedagogy.

In teacher education-programmes, both onsite and online, the teachers were particularly concerned with dialogue based learning and co-creation of knowledge. Various technologies were adopted to support this pedagogical approach. In the research literature there seems to be agreement that a precondition for successful dialogue online is that it must be integrated into the very structure of teaching. Many students do not participate in online dialogues even if they are encouraged to do so by their institution (see e.g. Shearer, 2009). The lecturers interviewed in this study confirmed this experience. In one of our cases, an online educational programme on nursing, teaching staff had dedicated a full month before the semester started, to facilitating communication and helping students to become familiar with each other and teaching staff via the Internet.

Although a number of learning resources appear to be specific to certain subjects, making it necessary for students to master these specific technologies, we also found examples of general digital learning resources that can be adapted to multiple subjects and teaching syllabuses. Much depends on how the teachers themselves identify the potential in the technology and apply it in developing their own participatory approaches. Different digital learning resources and technologies can therefore help to achieve participative or "student-active" teaching regardless of the number of students. A digitally competent teacher is thus characterized as one who has mastered methods of making students become actively involved in their own learning process.

### ***Learning processes; students and digital literacy***

Teachers considered students as quite traditional in their expectations of how teaching should take place. Many students even showed resistance to having to include digital tools and learning resources as part of the education. Through our interviews with the students, however, the picture became more nuanced. Perhaps not very surprisingly, the students seem to have trouble reflecting directly on their use of technology in isolation from the subject they studied. We interviewed students in different education programmes and in our study it

became clear that student teachers came in a unique position, given that education in itself is intended help the students develop their own profession professional digital literacy. We would therefore expect these students to reflect on their own teaching practices and use of digital tools. Through the interviews, we heard how this was done, for example, about how the experiences of teaching practice was reproduced in terms digital stories that combined sciences, education and technology use, and their own process of learning by reflecting was embedded in this narrative .

### ***Learning resources; the use of video recording***

To provide access to education by using different technological solutions does not necessarily imply a promise of increased quality of education, although it may indirectly have this effect, given that ICT is applied in an educational manner. In our cases we found that when ICT enabled collaboration regardless of time and space, it contributed to increased flexibility for both teachers and students, which itself was considered a mark of quality. In addition, both teachers and students considered video recordings as contributing to increased quality of education particularly as they served as good resources for revision and repetition of classwork.

A new trend in the use of video recording in teaching are variations of what is referred to as “inverted classroom pedagogy.” Several of our cases present variations within this concept and lessons learned so far are complex, in that both teachers and students are facing new forms of teaching and learning. Students are not necessarily interested in non-traditional forms of education even though they are interested in technology that maintains flexibility (OECD, 2012). Not surprisingly, we found that students were somewhat mixed in their reception of inverted classroom pedagogy.

### ***Learning Contexts***

Students and teachers were largely satisfied with the equipment situation in educational institutions. Nevertheless, we got the impression that some of the technological equipment was out-of-date and in need of upgrading. In addition, the technology appeared to have stagnated in several places, in the sense that little new was added to educational institutions after a basic infrastructure was implemented a few years back. For example, many teachers wanted digital boards. When quality of equipment was poor, we found that this affected the extent of its usage in teaching and learning situations. Another observation was how professional environments which embraced both pedagogical and ICT expertise were key drivers in the effort to develop excellent teaching and learning opportunities using ICT. Such environments also represented purchasing expertise for new technology. At its best, innovators in how ICT can help to improve the quality of teaching acted as an important support in getting teaching staff to adopt new ICT-supported approaches in the educational work.

## **Summary**

Initially we asked about how ICT can help improve the quality of teaching and learning. In this paper this has been illuminated based on the three main categories of EFQUEL, learning resources, learning and teaching contexts. The research literature emphasizes that a digitally competent teacher should be able to combine content, pedagogy and technology in a seamless way of teaching. In our study, we found examples of this kind of teacher. We have also seen that teachers' own understanding of what it means to be a digitally competent teacher varies. While some teachers were mostly concerned with hooking different technologies / software on to traditional education, others wanted to exploit the options provided by the various technologies to improve the quality of their own teaching practice. We found that when teachers succeeded in involving students and making them more proactive in their own learning process, the students reported a greater experience of educational quality. We have seen that ICT can help in many ways in such processes, and that much depends on learning digital skills related to teaching. To stimulate students in their own learning comprises various approaches; much depends on the subjects' uniqueness, number of students in an educational programme, and on context; campus students and online students. Nevertheless, there is a common denominator and that is that the students are no longer passive consumers of education, but must instead actively participate in learning activities. We have seen how ICT contributes on many levels in such processes and will be adjusted to the subjects and programs, not to mention the number of students admitted to degree programs. Work requirements, and the practice of reverse classroom pedagogy represent some examples of this kind of approach. Both teachers and students are aware of and see the need for multiple teaching methods and our study has provided many examples of how ICT can contribute to these multiple methods, such as the use of videos of teaching as learning resources. We have also seen how a certain minimum level of technological infrastructure and access to expertise is crucial to the success of the learning and use of learning resources. Finally, our study suggested that the teachers, who achieved this seamless integration of ICT into their teaching, were enthusiastic individuals willing to put in a lot of extra time to make things work. If the ambition of ICT in education is to raise the quality beyond these enthusiastic individuals, then we conclude that this will require a more systematic effort by management of educational institutions.

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## UNIVERSITY AS AN EXTENDED ENVIRONMENT: A QUESTION OF “E-QUALITY”

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### **Introduction: University in the 21<sup>st</sup> Century**

The activity context of universities in the 21<sup>st</sup> Century is involved in rethinking processes about both learning space and time and the prospect of student-centred environments in which the student, through dialogue and collaborative relationships, actions, reflection and discussion with peers, learns skills that may be useful when facing cognitive, ethical and social challenges of lifelong learning and “learning to learn” (Delors, 1996; Loiodice, 2011).

Therefore, there are several challenges arising and the University must be regarded as the drawing power of the lifelong learning process (Unesco, 1998) to be able to face them; in particular, university must become a place of collaboration, experimentation, reflection and innovation generation (Morin, 2000).

University will mainly drift towards planning and building extended and collaborative learning environments (Ellerani, 2007), integrating the technological dimension into its own structure and being able, especially through internet and web technologies, to overcome the problems connected to space and time as well as the dichotomies between inside and outside and face-to-face and distance; this is what Lévy defines, by means of an effective metaphor, as «*Moebius effect*» (Lévy, 1997, p.127). In particular in the technological dimension, university must be able to plan learning environments in which the students can build “lifelong skills” through interaction in real and virtual discussions and activities within a community connected to the web (Baldassarre in Loiodice, 2011, p.62). The extension of the environment through the technology and in the technology provides the university offer with a civic value, contributing to “*nurture the talents and skills of all its members as much as possible and fully committing itself to lifelong learning and to a wider participation to higher education*” (Comunicazione Lueven, 2009).

This vision also includes the idea of a “*capability approach*”, which has been borrowed by the economic field and has become an educational framework (Sen, 2000; Nussbaum, 2012). It is an approach based on the idea of conveying and providing *conditions and opportunities to “be able to be and to do”*, in other words allowing everybody to develop his/her talents and to act (*to be and to do*) within a particular context; in this way, talents can be capitalized and used to transform one’s own lease of life (*to realize what one could be and do if one had the will to do*

it). In this sense it is interesting to see the relationship between the open education on offer for everyone (open, distance, e-learning education) and the opportunities described by this approach (Tait, 2013).

Hence various and diversified challenges are involving higher education and they are arising through several initiatives and prospects characterized by the idea of *openness* (openness of contents, resources, data and environments), by the phenomenon of *Moocs* (Massive Open Online Courses), and by the increase and pervasivity of technology and digital and mobile devices which permit an increasingly effective connection and interaction. For all these reasons, “*Education paradigms are shifting to include online learning, hybrid learning, and collaborative models*”, as described by the New Media Consortium, NMC Horizon Report 2013.

On the basis of these premises, the study described below is intended to respond to two issues connected to the expression “e-quality”:

11. How can an institution reconfigure itself in order to meet the requirements of lifelong learning with the aim of reaching social justice according to the capability approach? (social innovation-organizational innovation)
12. How can the new digital formats and digital environments support the quality of a teaching/learning process that is intended to be more suitable to the needs of “learning to learn”? (educational innovation)

### **The case: the blended learning post-graduate master programme**

The study is intended to observe the development following the decision to open a post-graduate master programme in blended mode for adult and working students in a territory characterized by transfer difficulties resulting in enormous transfer times. The purpose of this kind of study is to bring into focus all the needs, impressions, beliefs, problems, resistance, openness, risks, and opportunities, in order to understand and plan an environment that may be really “capacitating”, open to the needs of the new students for flexibility and openness, but also for effectiveness and quality of the student-centred pedagogical and educational offer supported by digital tools and environments.

### **Theoretical and methodological framework**

The reference theoretical framework is related to the dimensions of the collective and connective intelligence (Lèvy, 1996; 1997; Siemens, 2005) of situated, interactionist and collaborative lifelong learning (Delors, 1996; Alberici, 2008; Wenger, 1998; Slavin, 1996), to the participating and active dimension (Jenkins, 2007, 2010; McLoughlin & Lee, 2008) of adult, reflexive and transformative learning (Knowles, 2001; Mezirow & Taylor, 2009; Schön, 1996; Merriam, 2010) and to the ethical and social dimension of inclusion, access equity and capability approach (Elias, 2010; Ciraci, 2008; Nussbaum, 2012).

Other references are e-learning, online learning, in particular blended learning in higher education (Ardizzone & Rivoltella, 2003; Scurati, 2004; Galliani, 2005; Calvani, 2005; Trentin, 2008; Conole, 2013, Salmon, 2012) and the design of learning environments (Conole, 2013, Laurillard, 2012).

The study also considers a further important phenomenon that is interesting and upsetting the academic world: the appearance and growth of Moocs (Massive Open Online Courses), which represent a solid experimentation training ground for new forms of openness and knowledge-sharing based on different dimensions and on digital and social environments (Johnson et al., 2013).

From a methodological point of view, this study finds its place in the field of qualitative researches, which try to understand phenomena in their complexity (holistic approach) through the procedure of the case study and according to an inductive process that uses specific observations to build more general and interpretive patterns.

The sources are represented by all the members of all levels in the university who are involved in the process: leadership, course teachers, students, technicians, office workers, and consultants, as well as external members represented by the local services that interface with the university.

The instruments consist in focus groups, semi-structured interviews, participating and non-participating observation, and questionnaires.

## **The research phases**

The research design develops over three phases, which are referred to three process levels:

- macro-level: exploration of the concepts of accessibility and flexibility through a survey among the different stakeholders;
- meso-level: observation of the different phases of the design of the extended learning environment and the collaboration relationships between the different individuals who play a role within the university;
- micro-level: observation of the educational and pedagogical actions and transformations occurring within the extended learning environment.

Each phase produces elements to understand certain aspects of the phenomenon and permits to reorganize the research according to the new elements acquired, which extend the starting cognitive frame in an open and interactive scheme whose development procedures arise during the research.

### ***First phase: exploration of blended learning (environment openness)***

The exploration phase was conducted through interviews and focus groups and was intended to investigate how the different individuals who play a role within the university perceive the concepts of blended learning and environment openness. The purpose of this phase was to

determine the human and technological resources, expectations, resistances, motivations and fears of the different interviewed people.

Table 1: Explorative research about “blended learning, perceptions, conditions”

reasons for exclusion	geographical distance, times, transfers, job, other engagements, age
social dimension	appreciation of flexibility and accessibility
pedagogical and educational dimension	open questions “participation, educational relationship, education quality, digital skills”
organizational and institutional dimension	support by the leadership, suitable human and technological resources

**Second phase: design of the learning environment**

This phase was conducted through participating observation and provided documentary evidence of the interaction of the different subjects involved in the transformation of the offer, in particular teachers, technicians and office workers, who have let their specific skills (educational and pedagogical, technical and instrumental, organizational) flow together in a synergy by means of a plurality of tools and environments, in order to create a multi-mode learning environment characterized by synchronous and asynchronous phases; this is a learning environment that is articulated in the different educational classrooms (Ardizzone & Rivoltella, 2003; Laurillard, 2012).

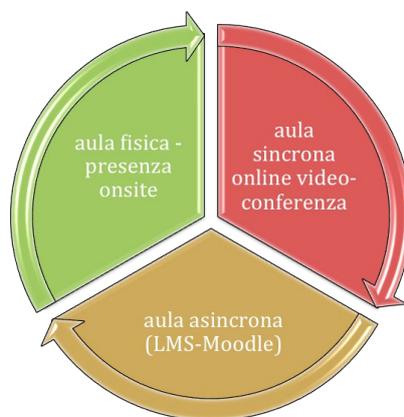


Figure 1. Multi-mode extended environment

In particular, an open environment has been created: it is open to different forms of participation (face-to-face, online via videoconference through Lync, asynchronous through Moodle), which the students can choose according to their availability in terms of time and own engagements. The university is responsible for involving and supporting teachers and students by supplying them with videoconference software to overcome the technological divide and by training them to use it through diversified familiarization processes (onsite, online, asynchronous).

**Third phase: monitoring (October 2013 – June 2014)**

In the third phase, which is still in progress, a monitoring process has been started. It is structured in moments of non-participating observation of the development of the educational activities in a multiple environment: in particular the aspects summarised in Table 2 have been monitored.

Table 2: Summary of the observations

	<b>Student</b>	<b>Teacher</b>
Attendance	blended, asynchronous, assessed for “participation”	In a physical classroom for most of the courses
Privacy	Problem with the recording (sensitive data) and tracking of the activities	Classes copyright problem solved with Moodle
Participation	<ul style="list-style-type: none"> <li>– “Diffused” throughout the different environments</li> <li>– On-site “im-mediate”, spontaneous</li> <li>– Online “mediate”, filtered by different tools, more reflective</li> <li>– Asynchronous in forums for discussion, sharing, peer assessment</li> </ul>	<ul style="list-style-type: none"> <li>– On-site and online via videoconference</li> <li>– Asynchronous and non-homogeneous (forums have not been activated homogeneously)</li> </ul>
Role	<ul style="list-style-type: none"> <li>– Active, interactive</li> <li>– Involved in the design process</li> <li>– Bearer of different experiences and background</li> </ul>	<ul style="list-style-type: none"> <li>– Less directive, more open and flexible, horizontal, coordinating, activating</li> <li>– More constant in time (before-during-after)</li> <li>– “Lighter but more extended” presence</li> <li>– New ways of communication required by the digital tools and environments (tele-teacher-presence)</li> </ul>
Method	<ul style="list-style-type: none"> <li>– Collaborative work, open to the others’ contributions</li> <li>– Peer learning</li> <li>– Peer assessment</li> </ul>	<ul style="list-style-type: none"> <li>– Collaborative learning design with technicians, teacher and students (conversational framework)</li> <li>– Flipped classroom</li> <li>– Case study</li> <li>– Discussion time</li> <li>– Collaborative learning</li> <li>– More direct and continuous relationship with students</li> <li>– Personalization of paths</li> </ul>
Assessment	<ul style="list-style-type: none"> <li>– Of active participation</li> <li>– Of the product by means of peer-assessment, tests, essays, e-presentations</li> </ul>	<ul style="list-style-type: none"> <li>Of the process by means of</li> <li>– learning analytics</li> <li>– focus groups and questionnaires</li> </ul>

The assessment performed by the students (focus groups and questionnaire) highlights.

Table 3: Summary of data and assessment by the students

Context	<ul style="list-style-type: none"> <li>– Gender of users: 90% female</li> <li>– Heterogeneous composition of the group (28% education, 44% social worker, 17% student, 11% other)</li> <li>– Predominance of working time (full/part time (84%))</li> <li>– “Online, on-site, asynchronous” participation distributed in about 30-33% for each modality</li> </ul>
Satisfaction	<ul style="list-style-type: none"> <li>– Good level of satisfaction regarding the extended modality and the instruments used (videoconference and asynchronous classroom) to access the classes</li> <li>– Importance of the integral video recording of participating classes to convey the classroom mood</li> <li>– Perception of the “transformative” value of collaborative and participating learning</li> <li>– Perception of the sense of community of learning and practices</li> </ul>
Needs	<ul style="list-style-type: none"> <li>– Improve the scheduling of workloads (too many requests in concomitant courses lead to cognitive overload)</li> <li>– Information overload (need for a better management of contents – consider a content manager)</li> <li>– Shared policy about the management of time, requests and didactics (consider a similar structure for all teachers)</li> <li>– Create a community of practices among the teachers to spread good practices</li> </ul>

## Conclusions

The study, which is under completion, is bringing into focus the two features advanced in the planning phase: the equality/equity dimension as the necessity to respond to users with diversified needs and engagements and the e-quality dimension, which is centred on the quality of the offer. From this point of view, the idea of participation (Jenkins, 2010) emerges as an added value for blended learning environments. Participation requires organizers and teachers to carefully design the course modalities, the requests to the students and the scaffolding that has to be offered, in order to encourage the students’ contribution and the acknowledgement of a different dimension of “attendance”. In turn, participation triggers comparison and discussion processes among the teachers of the different modules, the technicians and the available resources, and the students themselves. Participation encourages collaborative work, listening and interdependence with peers, discussion and mutual support, and therefore it enlarges the complexity of roles both of students and teachers. Participation is interconnected to path creation and personalization in a pedagogical dimension, which was effectively described by McLoughlin’s model 3P’s of Pedagogy – Participation, Personalisation, Productivity (2008).

The case is still on-going: the critical issues connected to complexity, training of teachers and adaptation of students, the matter of privacy and copyright in the open society, the management of digital tools and environments, the contraction of resources during this time of economic crisis are all factors that must be monitored constantly and that need a shared solution. However, the results increasingly encourage a focus on student-centred models, in

which the students are responsible for their own education in a “ubiquitous learning” (Cope & Kalantzi, 2009) and “diffused participation” dimension, and on the transformation of the teacher’s role – coach, visible, mentor, aggregator. On the one hand the role of teachers is relieved in terms of conveyance and management of contents, while on the other hand it expands in time and space within a “lighter but more extended” dimension.

Therefore, it seems to be possible to state that the idea of “e-quality” may be realized only by sharing a rigorously pedagogical prospect regarding the use of technology, which does not have to be lead by the question “where are we going?” but rather by the question “where do we want to go?” (Dublin, Teaching & Learning, 2014).

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## **University as an Extended Environment: A Question of “e-Quality”**

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## **THE LIBE PROJECT DISTANCE LEARNING PLATFORM – EVALUATING AN ADAPTIVE E-LEARNING SOLUTION**

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### **Adaptive Learning to Personalized Education**

Technological innovations have made it feasible for humankind to customize how to shop, to accomplish banking tasks and how to interact one with each other, nevertheless the traditional classroom model, or most part of it, continues to be based on a “one size fits all” paradigm. This could guarantee a high level of efficiency, but it does not consider individual students’ strengths and weaknesses as it should (Reiser, 1987).

In the field of education, existing technological solutions provide a good implementation of the traditional classroom model, at distance or not, but they also lead to a monolithic interpretation of the learning process. To guarantee a high level of learning experience for students it is necessary to allow users to take choices in order to regulate the learning processes. At the same time, these choices are anticipated by the system considering the evolution of the processes themselves, and so on (Park & Lee, 2003).

Recently, the growing need to support a new model of personalized education has motivated experimental pedagogy research combined with the information and computer science in order to achieve new technological solutions to tailor the learning experience onto student’s previous experiences, actual perceptions and future needs. Nowadays, with the introduction of newly developed tools for e-learning is possible to reach a new, higher level of customization both in distance and in face-to-face education.

In literature, adaptive learning is commonly described as an educational methodology which combines different techniques and strategies for instruction and resource utilization to allow students to take various itineraries to, and different amounts of time for, reaching the same educational goal (“mono-itinerary model”) or a range of comparable goals (“multi-itinerary model”) (Wang & Lindvall, 1984; Park & Lee, 2003).

Another way to define the meaning of adaptive learning is to highlight the differences between other terms commonly used nowadays in the field of educational technology like differentiated, personalized and adaptive learning in a digital environment. Differentiated learning is when there are different paths that learners can choose within a learning environment, but these paths are pre-organized as pre-set categories. Personalized learning is

when there is a different learning path for each individual student, usually obtained by the system through a rule-based algorithm (e.g. a decision tree). Usually as first step learners take a pre-test that will be used to define the individual's path and didactic materials. At last, adaptive learning is when there is not any pre-set path, but an algorithm data-driven constantly obtains students' data from the system, analyse them and adapts students' learning path in order to better define student profile and to improve its own rules and routines over time.

These three concepts are not to be intended as a succession of steps, but they are more like to be interpreted as different possibilities to achieve personalization in education. It is important to stress that they are not mutually exclusive, on the opposite it is essentially preferred to achieve all of them simultaneously.

Nevertheless, this categorization implies the assumption that the machine should make the learning path selection for the students. Currently, this approach has been overtaken by a more comprehensive idea of smart tutoring the student. Hence, there are other effective approaches to educational technology which foster algorithms relying on the idea of empowering the learner in selecting his/her own path – as either a pre-set category or even to create his/her own path that adjusts over time based on the learning process and interactions with other learners.

From a historical overview, the adaptive educational systems could be categorized mainly into four different approaches based on the theoretical model used to achieve the adaptation, in other words, on which educational elements are adapted in order to match the learner's needs: the macro-level approach, the aptitude-treatment approach, the micro-level educational approach and the constructivist-collaborative approach (Park & Lee, 2003; Mödritscher et al., 2004).

The first approach focuses on goals, depth of the course and delivery systems, in this approach educational alternatives are chosen based on the student's educational objectives, abilities and achievement level in the course structure. The second one focuses on adapting the educational procedures and strategies in order to match the student's individualities for the education and the selection of educational plans that ease the learning progress of the student/students with the same qualities. The third one analyses the student's learning necessities throughout the education and offer educational indications according to his/her needs. The fourth approach is related to modern aspects about how an e-learning system can be employed within the learning process following the constructivist pedagogical approach.

It is about two decades that the educational research is mainly focused onto Web-based educational systems (Kahn, 1997). There are different kinds of adaptive Web-based systems, which can be divided into three groups, summarized as follows (Brusilovsky et al., 1998):

- *Adaptive Information Systems* (AIF) which serve personalized information online.

- *Adaptive Filtering Systems* (AFS) which help user to find relevant information in the Internet.
- *Adaptive Educational Systems* (AES) which aims to adequate its relation with the student according to a predefined but updatable model of the user that reflects his objectives, preferences, knowledge and competences.

The latest group is the most investigated: the most part (about more than half) of the existing adaptive Web-based systems could be categorized as AES. The reason for this to happen is that the first two groups could be considered, in certain conditions, as subgroups of the third. In other words, the three groups are not so distinct between them. For example, an on-line information system can be classified as an AES depending to what audience it is referred to. A second reason is that systems in the AES group are considered as more multipurpose and adaptable type of system than the others in the other group. This is a strong motivation for researchers coming from different areas to stay focused and work mostly on AES group. In the end, from the technical point of view, developing technologies for an AES is more feasible since developers can rely on components already used and tested in earlier smaller projects (like standalone Intelligent Tutoring System (ITS) or Adaptive Hypermedia (AH) systems). For example the Web-based AES CALAT, or ELM-ART, or WITS have been created pre-existent ITS.

Since the Web is the most viable mean for distance and blended learning, this document will focus specifically on Web-based Adaptive Educational Systems (Web AES), analysing them according to applied adaptation technologies. For the LIBE project purposes, it is convenient to categorize the available technological solution based on the technique used for obtaining the adaptation and their availability.

As stated before, all kinds of adaptation technologies used in Web AES are implemented starting from either the ITS area or the AH area (Brusilovsky et al., 1998). For the ITS source, there are the following approaches: curriculum sequencing, interactive problem solving support, intelligent analysis of student's solutions, adaptive collaboration support, and example-based problem solving support; for the AH: adaptive presentation, adaptive navigation support and user modelling.

Both of the approaches are discussed in the next paragraphs.

## **Current Approaches to Adaptive Learning**

This paragraph provides a concise review of existing research on adaptive Web-based educational systems. To categorize the different approaches has been taken in into consideration one main aspect of the systems: what is adapted. As stated in the paragraph before, in this review are considered two major groups of AES, the ones coming from ITS area and the other coming from AH area. Nevertheless, it is expected that in a near future new adaptive technologies will be developed as for example, adaptive translation of voice and text materials.

Hereafter it is reported the list of reviewed approaches, the first five could be categorized as originating from ITS field of study, the other from AH field:

- **Curriculum sequencing techniques:** this is the more aged and, at the moment, the most common technology for Web-based AES. These techniques are divided into high-level sequencing or *knowledge sequencing* (determines next concept or topic to be taught) and low-level sequencing or *task sequencing* (determines next learning task – problem, example, test within current topic) (Brusilovsky, 1992). Sometime these techniques are mentioned also as *instructional planning technology*. The principal aim of curriculum sequencing is to deliver to the student the most appropriate individually calculated sequence of learning units and tasks to study with. In this case the system assists the student in order to obtain the “optimal path” through the learning material.
- **Interactive problem solving support:** this approach implements an algorithm to support the student during each step of problem solving, providing him/her an intelligent help that varies from the simpler task of giving a hint to the more complex task of executing the whole next step for the student. Usually a system that adopts this kind of approach registers all the actions of the student, try to recognize them, and use this information to help the student and to adapt the student model. This technology is widely used in teaching programming, one of the most common examples is the LISP-TUTOR software from Anderson & Reiser.
- **Intelligent analysis of student solutions:** this kind of technologies considers exclusively students’ final answers to educational problems (from a question to a programming task) and do not analyse how these answer were acquired. Nevertheless, intelligent analysers can provide other information than whether the answer is correct: what exactly was wrong (or incomplete) and to what knowledge these errors were related. As before, intelligent analysers provide extensive error feedback to the student and can adapt the student model. Systems providing intelligent analysis of solutions are very suitable in the context of slow networks since they need only one interaction between browser and server for a complete iteration.
- **Example-based problem solving:** this kind of approach is not so widely adopted. It consists of a system that provides the student with help examples from their own earlier experience in solving new problems. In other words, an ITS recommends to the students the most relevant cases (for example problems already explained or solved). One benefit of this approach is that it does not require an extensive client-server interaction.
- **Adaptive collaboration support:** this approach is not related to the single student, but it is adopted to deal with a group of student in a collaborative learning environment. A system which uses this technology has stored all the user’s history in relation to well defined user models in order to arrange a matching collaborating group. It could also provide the most suitable peer to answer to a particular question, or create the group in the proper moment of time to answer to a specific collaborative problem situation.
- **Adaptive presentation:** a system with adaptive presentation try to adapt the content of the text learning material (e.g. a hypermedia page) to the student’s objectives,

knowledge and other information stored in the user profile. In this kind of approaches, the material provided are not static, but dynamically adapted, newly generated or assembled from pre-existent materials, for each user. For example, an adaptive presentation system could adapt reading material giving to expert students more exhaustive and specified information, while to novices additional explanation. This kind of adaptive approach is crucial in Web-based AES because the same material could be automatically tailored to a large number of different students.

- **Adaptive navigation support (ANS):** these kind of techniques are particularly related to the Web navigation: an adaptive navigation system supports the user in hyperspace orientation adjusting dynamically the appearance of links on the page. In other words, it is possible to adaptively hide or annotate links or to dynamically sort them to help in the choice of the next link to read. Logically, this technology could act as an application of curriculum sequencing technology into hypermedia contexts. As for the curriculum sequencing, it is aimed to provide suggestions to students in order to obtain the “optimal path” through the learning material (in this case hypertexts). One big difference is that the ASN provides to the students a wide range of links among which to choose, leaving the choice to the students, instead of pointing the student to the next learning task.
- **User Modelling:** nowadays, the creation of user model has become a challenge. It is a prime application of standard machine learning techniques. The ability to create tailored environments depends mainly on the amount and accuracy of information stored in each user model. Past user’s behaviour could be used as training examples by a machine learning system. The need for large labelled data sets could be faced through the use of modern data mining techniques in order to handle large amounts of data. Actually, these solutions are explored by researchers and are object of modern educational and informational research.

It is a proven fact that adaptive technologies can enhance the learning experience from a pedagogical point of view to a more practical one: adaptive presentation increases the usability of learning material; ANS and adaptive sequencing are recommended for overall course adaptation and to provide student with suggestion to highest relevant materials; with their interactivity and intelligent feedback, intelligent solution analysis and problem solving support considerably improve the feasibility of assignments; machine learning and data mining techniques are the most advanced solution to create a more detailed and reliable user model. At last, but not least, adaptive collaboration is a relatively recent technology devoted to a specific pedagogical approach providing new opportunities for communication and cooperation. The most part of these technologies is in a research phase, providing results only in their respective fields, nevertheless it is already possible to reuse some of their implementation in a working learning environment.

The following table presents a first draft of the evaluated AES, detailed following the approaches and characteristics described above.

Table 1: Inventory of personalized solution for e-learning

AES	Hypertext component	Adaptive sequencing	ANS	Problem solving	Intelligent analysis	Adaptive presentation	Developed	Integration
OrbisDictus	Y	N	N	N	N	Y (text materials)	Y	N
LAMS	Y	Y	N	Y	Y	N	Y	Y
Xerte	Y	Y	Y	Y	Y	Some	Y	Y
Desire2Learn	Y	Y	N	N	N	Y	Y	Y
TAO	Y	Y	N	N	Y	Y	Y	Y
KNewton	Y	Y	?	?	Y	?	Y	?
CALAT	Some	Y	N	N	N	N	Y	N
ELM-ART	Y	Y (course, text)	Annotation	N	Y	Some	Y	N
AST	Y	Y	Annotation	N	N	Some	Y	N
InterBook	Y	Y	Annotation	N	N	Some	Y	N
Medtec	Y	Y (tasks)	N	N	N	Some	-	N
C-Book	Y	N	N	N	N	Y	Y	N
PAT - InterBook	Y	Y	Annotation	Y (server)	Y	Some	Y	N
DCG	Y	Y	N	N	N	N	Y	N
De Bra's	Y	N	Disabling	N	N	Y	Y	N
WEST-KBNS	Y	N	Annotation	N	N	N	Y	N
PAT	Y	N	N	N	N	N	Y	N
WITS	N	N	N	N	N	Y	Y	N
Belvedere	N	N	N	Y (java)	N	N	Y	N
ADIS	N	N	N	Y (java)	N	N	Y	N
D3-WWW-Trainer	Y	N	N	Y (java)	N	N	Y	N
Manic	Y	Some	N	N	N	N	Y	N

## Towards A LIBE Adaptive Learning System

Currently, the presented list is an attempt to evaluate as more as possible solutions to be used in the LIBE Project in order to achieve personalization of learning experience. Since pre-existent and commonly used LMSs (e.g. Moodle, Canvas, Blackboard) offer only a partial personalization of learning experience, some researchers agreed to resort to add-on applications in order to extend them with adaptivity features. In literature, it was observed that, even if these LMSs are universally used to provide teachers with tools to build and manage online and face-to-face courses, they do not offer to the student a complete personalized learning experience (Peter et al., 2010). It is a shared opinion between academics that further researches on designing and developing add-on applications to extend LMSs adaptivity features are needed since commonly adaptivity is widely used in activities not strictly related to education (e.g. social media) and should be revised in order for being used for educational purposes (Bachari et al., 2011; Wen et al., 2007).

Some of the software applications listed in the previous paragraph could be assimilated to traditional micro-adaptive educational systems: they are adaptive but not adaptable to every learning condition, in other words the “intelligence” of the software is system-dependent and it is not transparently available to the user (Brown et al., 2005). Conversely, each type of software can be more successful than the other based on what types of learning conditions or learners are present in the final scenario. It was argued that adaptive educational systems should be controllable by the teacher or by the student him/herself because sometimes they cannot be smart enough to adapt in a suitable way in all possible situations (Triantafillou

et al., 2004), therefore, it is reasonable to apply for a system with more available functions (e.g. ANS and adaptive sequencing) instead of focusing on only one type of functions (Park & Lee, 2003).

Nowadays, it sounds realistic that more studies are needed to support the standardization and the optimization of the findings and implementations obtained from educational research into AEH systems. Nevertheless, from the list proposed in the previous paragraph, it seems reasonable to identify at least three most feasible tools to be used in the LIBE project to achieve a good level of personalisation and adaptivity. They are the following:

- **Xerte:** The Xerte Project provides an authoring tool for learning object. It is open-source, free to use, and allows to export created learning objects in the most common format (SCORM 1.2 and 2.0). It has a strong developers and content authors community producing interactive learning materials. The Xerte community platform allows also to find already prepared learning objects.
- **LAMS:** LAMS is relative new software for designing, managing and delivering online collaborative learning activities. It has a highly intuitive visual interface that allows teachers to create rapidly complex scenarios in their learning objects. It is also provided in a module version ready to be used in the Moodle platform.
- **Desire2Learn:** Desire2Learn LeAP is an adaptive learning platform that adjusts to student's needs, returning a personalized study path and accelerating the learning process. Desire2Learn integrates and substitutes the formerly known Knowillage LeAP. This software uses a semantic engine to map learning materials to the knowledge objectives, then automatically selects relevant content from the existing materials, and the tutor can then adjust the learning path. It is only available as a commercial product. Nevertheless, it is possible to integrate its functionalities into Moodle platform.

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## MAKING ONLINE TEAMS WORK – THE TUTOR VIEW

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### Introduction

#### ***The opportunities and challenges posed by groups***

From a sociocultural viewpoint, working in a small team can be creative and inspiring, because, given the right conditions, thinking can be enhanced through interactions with others (called interthinking) (Littleton & Mercer, 2013). However, poor group dynamics can be a barrier to creative thought with problems including social loafing, authoritarian leadership where one individual dominates the others, and groupthink (a tendency to focus on internal consensus, rather than accept external criticism; Janis, cited in Littleton & Mercer, 2013). Littleton and Mercer suggest that many of these difficulties can be overcome by the group generating ground rules for working together, since these ground rules create an appropriate discursive environment for interthinking and creativity (e.g. Figure 1).

Class 7's ground rules  
when we work in a group ...  
Everyone offers relevant information  
Everyone's ideas are treated as worthwhile – but are critically evaluated  
We ask each other questions  
We ask for reasons and give them  
We try to reach agreement  
People trust each other and act as a team!

Figure 1. caption: Ground rules (source Littleton & Mercer, Figure 2.1, p.38)

Much of the research into group work in educational settings has studied face-to-face groups, where students interact directly however online student groups have additional, specific challenges. If students work in forums, they need to adapt to the asynchronous nature of the interactions. Exchange of information, clarifications and conflict resolution can be laborious and time-consuming (Littleton & Mercer, 2013); discussions can take tangential routes, meaning that students waste time and energy pursuing ideas which have moved on by the next time they log on (Ferguson, cited in Littleton & Mercer). Students may find different solutions to these problems, such as using synchronous talk to resolve issues quickly and basing discussion around shared knowledge.

## ***The Higher Educational context***

The past few years have seen a huge increase in the use of computer-mediated learning activities in the HE curriculum in the UK. Students are expected to access a VLE and online tuition is a common alternative or supplement to face-to-face teaching. Some subject areas such as Psychology require students to complete substantial amounts of empirical work in practical classes and in final year projects. Providing opportunities for students to fulfil these requirements online is a challenge that HEI need to rise to. The Open University (OU) offers a very popular Psychology degree that is accredited by the British Psychological Society (BPS) as providing the Graduate Basis for Chartered membership (GBC). Traditionally, the OU offered residential study – “summer schools” where students participate in an intensive course based in the premises of another university to complete empirical project work. While this continues to be an option, the OU has developed an online alternative. At OU level 2 (National Qualification framework level 5), students may choose between a traditional residential school module and an online module.

### *Online Project Module outline*

At the start of the module, *DZX222, Exploring Psychology Project* students take part in taught activities, using a variety of empirical methods and analysing data. They then undertake a small-scale project in groups of 4-6, under the close supervision of a tutor. The group must work together in formulating a research question, deciding upon an appropriate method of investigation and specifying a protocol. Each group then designs a research project, collects and analyses quantitative or qualitative data. Finally, the group prepares and delivers a short presentation (e.g. in PowerPoint). They are assessed on an individually produced project report. The module is worth 15 credit points and takes place over a 3-month period, building on a theoretically based 60-point module usually completed some 4 months previously. Communication among students and tutors is via asynchronous electronic fora, so although students must spend a specified minimum time online, there is considerable flexibility in when they do so. Location too is flexible, so access and engagement may be from the home, workplace, or even on the move.

The proportion of students opting for the online module has seen a notable increase over the past few years. A student survey (n=257) revealed students chose the online option to fit with their work and caring responsibilities; for some students this opportunity is highly valued because it is their sole opportunity to work with other students (Kaye et al., 2013). To complete their project, our students work as small project teams in online groups; however, group dynamics were identified as the worst aspect by more online than residential-school students. Thus, there appears to be a tension between the opportunities on offer for working with others in an online environment and the difficulties that can emerge from working in a small team.

Tutors have a unique perspective because they are participant observers of these small groups of learners: they read all the postings, interpret the interactions, try to ameliorate the difficulties and nudge students through to completion of their projects. This paper explores the group dynamics of these teams through the unique lens of their tutors, asking how tutors perceive their students.

## **Methods**

### ***Materials and resources***

The survey aimed to explore tutors' perceptions of their student groups by asking them to focus on their 'best' and 'worst' groups. It explored how tutors defined these groups, their perceptions about how the group worked together; and how reliant they judged them to be on tutor input. Issues about ground rules were explored in terms of whether they were introduced, and by whom; Finally aspects of group dynamics based on Littleton and Mercer's ground rules were explored (see Figure 1 and Appendix, question 6 (a-g)).

The survey was sent to all tutors employed on the online project module presented in 2013 (53 tutors with 25 responses – 21 complete and 4 incomplete). The survey consisted of 20 questions, with numerical and free-text responses. The first two questions asked about ground rules and how they were established; the others focused on the perceived behaviour in groups. Tutors were asked to identify two groups: their 'best' group and their 'worst' group; initially defining their own categorizations and then responding to nine questions about each group's behaviours. (See Appendix for survey questions and responses.)

## **Results**

### ***Ground rules***

Most tutors reported that they introduced or suggested some form of ground rules in the early stages of group formation (21; 84%). Most tutors said that they suggested using ground rules as a way to ease communication; others said that they suggested initial ground rules and then students adapted these to fit their groups. Even then, the process was not an easy one and could vary between groups – one tutor commented that they were 'by group discussion', adding 'if you could get all the group members to take part'.

### ***Comparisons between the 'best' and 'worst' groups***

#### **How are groups defined?**

Tutors identified a diversity of characteristics for their 'best' groups: these were groups where tasks were shared, deadlines were met, decisions made amongst members of the group; words like 'cooperation', 'collaboration' and 'support' were used. There was some disagreement about whether a leader was required – two tutors mentioned this as defining their 'best' group, but another emphasised that members 'pulled their weight' (equitable contributions), whilst supporting other members who found tasks difficult.

Tutors identified non-contributors as being a major source of difficulty in their ‘worst’ groups. The asynchronous nature of the discussion forums meant that students had to log on regularly to contribute; not doing so made it difficult for individuals to complete the time-limited tasks. Other issues involved not ‘listening’ to one another, particularly when dominant individuals were intent on doing things their own way.

### **How did the groups manage their projects?**

Table 1: Project management  
(numbers represent tutor’s choice of statement)

	<b>a. The group split the tasks</b>	<b>b. Group responsibility</b>	<b>c. Student ‘leader’</b>	<b>d. Some combination of a, b and c</b>
‘Best’ group	6	6	0	9
‘Worst’ group	3	3	5	10

Tutors indicated some differences in the way that their groups managed the projects (Table 1): the ‘best’ groups perhaps being more likely to be democratic and to allocate responsibility to individuals for specific tasks than the ‘worst’ groups. The worst groups were more likely to have a dominant group member who took charge and made the decisions.

### **When groups work together, what is perceived as important in terms of group dynamics?**

Tutors were asked to choose which statement characterised most closely how the students worked together in their best and worst groups (Table 2). Tutors’ responses suggested that the ‘best’ group could be characterised by mutual regard for one another: sharing information, listening to one another and respecting opinions and ideas. The ‘worst’ group could be characterised by dependence on the tutor: tutors reported that these groups needed regular forum intervention for facilitation, decision-making, and resolution of disputes.

## Making Online Teams Work – The Tutor View

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Table 2: Comparison of group dynamics  
(numbers indicate tutor's choice of statement)

	<b>'Best' group</b>	<b>'Worst' group</b>
All ideas and information were shared	5	0
All members of the group were invited to contribute to the discussion	4	0
Opinions and ideas were respected and considered by the students in the group	9	0
Students asked one another to give reasons for their views	0	0
Challenges and alternatives were made explicit and negotiated	0	0
The group tried to reach agreement before taking a decision or acting	1	0
Consensus was reached before actions were taken	1	0
The group needed guidance from their tutor(s) before making a decision	0	8
The group worked independently, with minimal input from their tutors	1	1
Their tutor(s) made frequent contributions to the forum	0	3
Students needed tutor input to resolve disputes amongst group members	0	9

### How successful were the groups?

Perhaps unsurprisingly, tutors rated their 'best' groups as being more likely to be successful than the 'worst' groups in working together to produce a joint project (Table 3).

Table 3: Successful outcomes  
(numbers indicate tutor's choice of statement)

<b>Producing a joint project was:</b>	<b>'Best' groups</b>	<b>'Worst' groups</b>
Totally successful	18	0
Partially successful	3	16
Totally unsuccessful	0	5

## Conclusions and Discussion

Tapping tutors' implicit knowledge about how groups interact online is very important in trying to unpick the opportunities and challenges for students in a high-risk module, where gaining high grades in their assessment depends on successful group work.

The asynchronous nature of forums provides an opportunity for reflection and considered responses. But group formation and task completion needs to be done quickly, making this more suited to a synchronous activity. This produces a tension since many students who choose the online project module do so because it fits into their lifestyle and their work responsibilities and caring commitments (Kaye et al., 2013). In reality, their personal circumstances make it difficult or impossible to commit to specific prearranged times to study. One way forward might involve seeking a way of capturing the advantages of synchronicity whilst working in an asynchronous medium.

In the initial group formation stage, establishing ground rules appears to facilitate what Littleton and Mercer call ‘interthinking’, where ideas and innovations emerge from group interactions. Most tutors initiated discussions about ground rules, some concentrating on the rules of netiquette, whereas others made students aware of how to create a good online working environment with mutual regard for one another. Some groups took up these ideas, but others didn’t and it would be interesting to investigate in a larger study which groups were more successful.

Whilst their ‘best’ groups had diverse characterizations, tutors identified group attributes which lead to productive teamwork as being important (such as mutual regard). The ‘worst’ groups had a difficult time in this online environment. Tutors provided a more coherent picture of these groups, with non-contributors being a major cause of tension. These groups were more likely to have leaders than the ‘best’ groups, but it was characterised as being uneasy alliance with one person making a decision and doing most of the work, and other members of the group (for whatever reason), lagging behind or just not turning up to post their ideas on the forum. Such difficult group dynamics were identified previously as a major source of dissent for these online students (Kaye et al., 2013). Students exhibited dependence on their tutors for decision making and conflict resolution; such dependence is contrary to the perceived benefits of collaborative learning and the desired learning outcome of independent learning. However, it is not clear whether this group trait is a consequence of the group and its poor dynamics or whether individuals who opt for this online module tend to be apathetic or lack the skills for working in a team.

Several issues arise from this small-scale study of tutors’ perceptions of their online groups. First, is the study valid: does this method of reflecting on and distinguishing between ‘best’ and ‘worst’ groups reflect reality or is there a ‘halo’ effect? If it is possible to characterise groups who are less likely to succeed in group tasks, what can be done about it? All tutors recognised the importance of ground rules; but should they be imposed upon the groups or should groups formulate them as part of the group formation process? Hurst and Thomas (2008) suggested that team-building is essential to group formation and successful task completion: ‘The biggest problem for any team is the assumption that you can put people together to work on a task, and they will automatically become a team and know how to work together’. Barrett and colleagues have recently completed a pilot study of an online team-building activity, where ground rules were generated by the students; preliminary results suggest that this was valuable for these students who had yet to do online project work, but it was costly in terms of student and tutor time. Even in this voluntary and low-risk activity with a group of interested volunteers, students engaged at different levels of intensity – with some students not contributing and others dropping out. So, what can we do for students who, however much we try to make project work palatable, still do not take part in collaborative activities – are they doomed to fail or can we find some creative way either to engage them or to provide an attractive alternative?

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## Appendix: Tutor questionnaire

The appendix lists the instructions and the 6 questions examined in this paper.

### *Instructions*

We are interested in how students work together on a collaborative task; particularly how they work together in small groups to design and implement a research project (as in DZX222). As you were recently a tutor on this module, we'd appreciate your telling us about how your students got on in their project groups.

Think about the best and worst groups you tutored in the last presentation of DZX222. We are not expecting more than general impressions about the two groups you have picked. If you cannot identify a 'worst /best group' because they were all fairly similar, use those you thought worked well/less well.

Now answer the questions whilst keeping these two groups in mind.

### *Questions:*

1. In your project groups, did you specifically encourage the use of ground rules for working together? (yes/no)
2. How were these ground rules established? For example, who suggested using them and who formulated them? [free-text response]

*Questions about 'best' group were presented first, then repeated for 'worst' group; as follows:*

Think about your 'best group' ['worst group'] and answer the following questions:

3. What made your chosen group 'the best' (for confidentiality reasons, please don't identify them)? [free-text response]
4. How did this particular group manage their project? (Please check one of the options below.)
  - a. **The group split the project into different tasks and each student took responsibility for one or more task;**
  - b. **The group took responsibility for the whole project; individuals were not allocated tasks but contributed across all/most of the project requirements;**
  - c. **One student took charge and made all the decisions;**
  - d. **Some combination of a, b and c. Please give a brief explanation of your answer in the box below.**
5. The answers to the last two questions relate to how the group worked together and made decisions. In your opinion which of your answers characterizes most closely how your 'best group' worked together? Choose one statement from the drop-down list below.
  - a. **All ideas and information were shared;**

- b. All members of the group were invited to contribute to the discussion;
  - c. Opinions and ideas were respected and considered by the students in the group;
  - d. Students asked one another to give reasons for their views;
  - e. Challenges and alternatives were made explicit and negotiated;
  - f. The group tried to reach agreement before taking a decision or acting;
  - g. Consensus was reached before actions were taken; a. The group needed guidance from their tutor(s) before making a decision; b. The group worked independently, with minimal input from their tutor(s); c. Their tutor(s) made frequent contributions to the forum; d. Students needed tutor input to resolve disputes amongst group members.
6. Which statement in the list below is the nearest to how your 'best group' worked together?
- a. Overall, the group was totally successful in working together to produce a joint project.
  - b. Overall, the group was partially successful in working together to produce a joint project.
  - c. Overall, the group was totally unsuccessful in working together to produce a joint project.





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## **MOBILE LEARNING DELIVERY VIA SOCIAL NETWORKS: WHAT PLATFORMS DO FIRST-YEAR UNIVERSITY STUDENTS PREFER?**

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### **Introduction**

Distance learning is an increasingly popular solution to campus overcrowding and student requirements for flexible schedules. Changing the traditional environment of the university classroom has encountered enthusiasm from many groups of faculty and students but it has also met with pockets of resistance. A primary potential benefit for institutions is more efficient use of technology based resources, through which students may potentially benefit from increased critical thinking, leadership, communication, and problem solving skills (Spangle, Hodne & Schierling, 2002; Katz & Yablon, 2003). Since its inception distance learning has progressed through delivery systems such as television broadcasts, videoconferencing and email, and at present focuses on digital delivery systems such as internet, mobile and social network learning platforms. Katz (2013) noted that almost all of the existing distance learning delivery platforms are used in different educational systems throughout the world. The present study will focus on smartphone and Facebook based learning delivery systems and the cognitive and affective outcomes for students receiving learning content via the two delivery platforms.

### ***Technology-Based Distance Learning***

Ismail et al (2010) confronted the implications of university learning and instruction using technology based distance learning courses. They contended that technology based distance learning has moved formal instruction in these courses from the on-site setting of the university campus to the home of the student. Learning has become significantly more flexible and content sources more accessible. Creating, sharing and knowledge capitalization are all facilitated by distance learning. Wider sources of learning are provided in technology based distance learning courses and worldwide expertise can systematically be brought to the student's desktop. With the rapid development of distance learning courses for use in university level education, increasingly more research studies have been conducted in an attempt to evaluate different issues related to technology based distance learning. For example Chandra & Watters (2012) indicated that learning physics through the medium of technology based distance learning not only enhanced students' learning outcomes, but also had a positive impact on their attitudes toward the study of physics. Ituma (2011) confirmed that a

large percentage of university students who were enrolled in distance learning university courses had positive perceptions of the technology-based learning methodology and were in favour of joining additional distance learning courses that supplemented traditional face-to-face classroom instruction.

Valaitis et al. (2005) found that students who participated in technology-based distance learning courses perceived that the methodology increased their learning flexibility and enhanced their ability to process content, and provided access to valuable learning resources. Abdallah (2009) indicated that technology-based distance learning courses contributed to improved quality of students' learning experiences. Delfino et al. (2010) confirmed that student teachers who participated in technology-based distance learning teacher training courses developed self-regulated and motivated learning which provided them with the opportunity to flexibly cope with their academic assignments.

### ***Mobile Learning***

Many universities increasingly implement a variety of mobile learning methodologies as viable alternatives to traditional classroom instruction. Mobile learning via internet, email, regular cell-phones, smartphones and Facebook are increasingly penetrating the domain of academic learning and provide students with dramatically increased access to sources and subject matter relevant to their studies (Ward, 2010; Katz & Yablon, 2011; 2012; Back, 2013; Katz, 2013; Sela, 2013). Current technology based mobile learning is, inter alia, based on materials provided through methodologies such as internet, email, cell-phones, smartphones and Facebook and an ever increasing number of research studies are being conducted in order to verify the educational value of such technology based mobile learning methodologies at the university level.

Cell-phone and Facebook based learning has advanced rapidly and is becoming an integral part of the learning process in many universities throughout the world. Some research studies have indicated that the use of cell-phones as a delivery platforms for university learning is suitable for both cognitive and affective aims (Garner et al., 2002; Prensky, 2005) and other research studies have emphasized the suitability of Facebook for delivery of learning at the university level (Robbins-Bell, 2008; Isacson & Gretzel, 2011; Harris, 2012).

### ***Cell-Phone Based Learning***

One of the emerging learning strategies that has developed in technology-based distance learning in recent years and is receiving growing attention from both students and teachers is in the domain of mobile learning, and more specifically, focuses on cell-phone learning technology (Prensky, 2005). It should be noted that the use of cell-phones is multi-dimensional and smartphone technology now provides technological possibilities including voice, text, still-camera, video, paging and geo-positioning capabilities. These tools provide a rich variety of platforms that enhance the learning process. Cell-phone based learning projects managed by several universities worldwide have indicated the positive outcomes of such

## **Mobile Learning Delivery via Social Networks: What Platforms Do First-year University Students Prefer?**

*Yaacov J. Katz*

learning methods (Garner et al., 2002; Seppala, 2002). Additional studies have described language learning based on cell-phone technology (Kiernan & Aizawa, 2004; Katz & Yablon, 2011; 2012). These studies describe how vocabulary transmitted via cell-phone based SMS messages in a spaced and scheduled pattern of delivery contributed to student proficiency in English or other languages.

### ***Facebook Based Learning***

Facebook has also become a learning resource within the domain of mobile learning. Harris (2012) indicated that university students who studied hospitality studies agreed that Facebook, as a learning delivery platform, is effective as well as stimulating for learning. Robbins-Bell (2008) indicated that Facebook provides students with benefits of open and collaborative learning beyond classroom and campus limits. Isacson & Gretzel (2011) noted that university students valued Facebook for providing an informal and motivating learning environment. Other research projects have indicated the positive potential of Facebook as a learning delivery platform at the university level (Stutzman, 2008; Madge et al., 2009; Limbu, 2011; Lateh, 2014). Cerdà and Planas (2011) and De Villiers and Pretorius (2013) found that when used as a learning delivery platform, Facebook enhances innovative learning, collaborative learning, critical collaborative thinking and learning motivation. Facebook has also been seen to enhance student-centred as well as social learning at the university level (Duncan & Barczyk, 2013). Mitchell (2012) indicated that Facebook based learning facilitated language learning as well as cultural learning of foreign students spending time studying at a US university. Kassem (2013) found that the use of Facebook in the Egyptian secondary educational system as a major learning delivery platform led to the narrowing of social gaps between students studying in general (more elite) and technical (less elite) high schools.

### **Research Issues in the Present Study**

Recent research studies have indicated the existence of a robust relationship between learning delivery platforms and the intensity of students' attitudes including learner motivation, learner curiosity learner autonomy, learning flexibility, learner control of learning, learner self-confidence, learner locus of control and learner technological self-confidence at the university level (Katz, 2013; Katz & Yablon, 2011; 2012). However issues such as the relationship between cell-phone and Facebook delivery of learning on the one hand and learner self-regulation, learner creativity and learner technological mastery on the other, has not been adequately researched and will be addressed in the present study. In addition possible similarities or differences between learning via cell-phone and Facebook learning delivery platforms and levels of academic achievement will be examined in this study.

## **Method**

### *Research Population*

The research sample consisted of 116 first year students enrolled in a 15 week semester-long mandatory historical and cultural Jewish concepts foundation course offered at one of the seven chartered universities in Israel. The students were randomly assigned to the two different research groups that were provided with lists of definitions of historical and cultural Jewish concepts as follows:

1. 62 students received their historical and cultural Jewish concepts lists via smartphone based SMS messages, power-point presentations and relevant videos;
2. 54 were sent their historical and cultural Jewish concepts lists, power-point presentations and relevant videos via internet to the Facebook course homepage.

### *Instruments*

Two research instruments were administered to the students in this research study. A standardized historical and cultural Jewish concepts test was administered to the participants in order to assess students' mastery of definitions of basic historical and cultural Jewish concepts. The test scale ranged from 0-100, the higher grades indicating higher levels of achievement on the historical and cultural Jewish concepts test. The second instrument administered was a 25 item Likert type response scale questionnaire (students responded to a five point scale with 1=totally disagree and 5=totally agree) designed to examine the students' perceptions of the affective psycho-pedagogical attitudinal research factors as follows: The first factor, learner self-regulation, contained nine items (Cronbach  $\alpha=0.84$ ), the second factor, learner creativity, consisted of ten items (Cronbach  $\alpha=0.80$ ) and the third factor, learner technological mastery, was made up of six items (Cronbach  $\alpha=0.85$ ).

### *Procedure*

Students who were graduates of the Israeli state secular and religious school systems and who were enrolled in the mandatory historical and cultural Jewish concepts foundations course and possessed personal smartphones were eligible for participation in this study. Following the selection of the students who met the above criteria, they were randomly assigned to the two delivery platform groups. Students in the first group received historical and cultural Jewish concepts via smartphone based SMS messages and those in the second group received historical and cultural Jewish concepts via the Facebook course homepage.

The students in the two groups were sent weekly lists that contained concise definitions of the historical and cultural Jewish concepts studied in the course, each list containing definitions of 30 historical and cultural Jewish concepts delivered via the two respective learning delivery strategies. Thus each of the students received definitions of 450 historical and cultural Jewish concepts during the 15 week long course. On completion of the course the students in the two groups were administered a cognitive standardized historical and cultural Jewish concepts

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achievement test in order to assess their level of knowledge of the 450 historical and cultural Jewish concepts taught in the course. In addition they were administered the attitudinal questionnaire which examined their scores on the three affective psycho-pedagogical research factors, namely learner self-regulation, learner creativity and learner technological mastery.

### Results

The main aim of this study was to examine the efficiency and effectiveness of two different digital social network learning delivery platforms. Two research issues were pinpointed: the first examined the acquisition by students of knowledge concerning historical and cultural Jewish concepts and the second investigated students' perceptions of psycho-pedagogical attitudes connected with the two learning platforms. The mean scores of each of the psycho-pedagogical factors were standardized in order to allow for a comparison between the factor scores. Standardized means and standard deviations of students' scores on the achievement test and on the psycho-pedagogical factors are presented in Table 1.

Table 1: Standardized Mean Scores and Standard Deviations of Students in the Smartphone and Facebook Learning Delivery Groups for Achievement, Learner Self-Regulation, Learner Creativity and Learner Technological Mastery

Group	Learner Self-Regulation Factor		Learner Creativity Factor		Lerner Technological Factor		Achievement	
	M	S.D	M	S.D	M	S.D	M	S.D
Smartphone Delivery N=62	3.64	0.71	3.28	0.45	3.50	0.96	84.17	7.71
Face-book Delivery N=54	2.92	0.75	3.06	0.30	3.01	1.02	83.89	8.16

Four one-way ANOVA tests were conducted in order to compare students' achievement and psycho-pedagogical attitudes as related to the two learning delivery platforms. While there were no significant differences between students in the two groups regarding their achievement scores, with students from the two groups achieving similar grades on the cognitive historical and cultural Jewish concepts achievement test, significant differences were found between students in the two delivery groups for learner self-regulation [ $F(1,114)=28.12$ ,  $p<0.001$ ,  $\eta^2=0.198$ ], for learner creativity [ $F(1,114)=8.83$ ,  $p<0.01$ ,  $\eta^2=0.072$ ] and for learner technological mastery [ $F(1,114)=20.77$ ,  $p<0.001$ ,  $\eta^2=0.154$ ] In all cases students in the group that received their historical and cultural Jewish concepts via the smartphone SMS delivery platform were significantly higher on the affective psycho-pedagogical factors than students in the group that received their historical and cultural Jewish concepts via the Facebook delivery platform.

## **Discussion and Conclusion**

Results of the statistical analyses of the data collected in this study indicate that neither of the two delivery platforms, namely smartphone based SMS delivery of learning and Facebook course homepage delivery of learning, had any significant advantage regarding academic achievement of students on the standardized historical and cultural Jewish concepts test. Students who studied via both strategies attained similar grades on the test. Thus it appears that achievement is a factor that does not distinguish between delivery strategies with measured achievement outcomes. This result confirms those indicated in a number of research studies that confirmed that, on the whole, different delivery platforms do not significantly contribute to differential academic achievement (Katz, 2013; Katz & Yablon, 2011; 2012).

However, the findings of the study indicate that the different learning delivery platforms employed in the present study to provide weekly lists of historical and cultural Jewish concepts to students are associated with significantly differential levels of learner self-regulation, learner creativity and learner technological mastery. Scores attained by students on the psycho-pedagogical research factors confirm that SMS messaging to smartphones is associated more significantly to students' learner self-regulation, learner creativity and learner technological mastery than delivery of learning via Facebook. It appears that students felt more in command of the learning process and more focused on the learning content delivered via SMS delivery than students who received their learning content via Facebook. It appears that SMS delivery of content is more goal-directed than Facebook delivery where social interaction may have negatively affected the focus of students on the learning material.

It may be concluded that the results of the present study indicate the positive relationship of SMS delivery of learning to smartphones to key psycho-pedagogical variables such as learner self-regulation, learner creativity and learner technological mastery. The results also indicate that although Facebook delivery is as advantageous as SMS delivery regarding cognitive achievement, it does not have the same potency as SMS to smartphone delivery when considering the psycho-pedagogical aspects of the learning process. Further studies need to be conducted so as to further explore the potential of Facebook as a delivery platform that could perhaps enhance psycho-pedagogical aspects of learning when better configured in its presentation to learners.

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## EVALUATING WEB CONNECTIVITY FOR ADULT DISTANCE LEARNERS – FACEBOOK OR FORUMS?

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### Introduction

Adult learners tend to have many demands placed up them, often preventing them from engaging in the traditional pattern of daytime study (Callendar & Feldman, 2009). Whilst online distance education offers adult learners opportunities to study without attending a campus-based university it also implies separation from fellow learners. Regarding distance learning in particular, the extent to which social interaction can be accomplished is open to question. At physical campus-based universities students have opportunities between lectures to discuss and debate topics relating to their studies. For those online distance learners who want to engage in interactive, collaborative learning, the question is to what extent students feel they belong to a dynamic network of learners? How does an online ‘virtual proximity’ relate to ‘physical proximity’ (Haythornthwaite et al., 2006)?

Tinto (1988) suggests that social integration, alongside academic integration, is key to retention within an educational environment. This paper explores the role the Internet plays in students’ social integration within the distance learning environment. The affordances of social networking sites, such as Facebook, are viewed in comparison to University-provided online forums.

### The context

The Open University has evolved significantly since its creation over forty years ago. It is not a profit-making institution, in contrast to many other distance learning providers, and aims to offer a high quality and well-regarded option for those who cannot, or prefer not to, go to a physical campus university. Key to its continuing success is the utilisation of new technologies. As Oblinger (2012, p.17) notes ‘*For education to do better we cannot just keep doing the same things*’. Academics are increasingly encouraged to implement new technologies in classrooms (Barnes & Tynan, 2007). Although many of these technologies may be utilised frequently in everyday life, their current level of use will not necessarily lead to widespread adoption in the academic world. It is far from clear whether teaching and learning activities that are underpinned by social networking, for example, can become fully established within a formal learning environment.

The Open University has developed its own style of distance learning called ‘supported open learning’, offering students opportunities to study flexibly, whether at home, work, library, study centre. Before the advent of the Internet, students relied solely on printed study materials. Contact with other students was via face-to-face methods, both formal tutor-led tutorials and student-led self-help groups. Contact with the tutor was via telephone, face-to-face or postal methods. There were necessarily restrictions to such interactions and the Internet offers potential for alleviating some of these.

## Literature Review

Students engaged in both formal and informal learning are increasingly being encouraged to take ownership of their learning (Sharples et al., 2010). They have the opportunity to build a Personal Learning Environment (PLE) consisting of many types of tools, possibly provided by the educational institution, but not necessarily. They might wish to learn individually or socially but, whatever their preferences, students need to be comfortable with the tools they select, and also have confidence that they can be used in a way that promotes learning in a constructive way. Hence a mix of approaches is required to accommodate student preferences (Bates, 2010), to meet the diverse range of student requirements within a learning environment. Distance learners, for example, might have particularly selected that study mode as they prefer to learn individually. However, if distance learners wish to interact with their peers there should be opportunities for them to do so. The main point to note is that, whatever students’ preferences, they should be met by the teaching institution developing a flexible learning environment.

Anderson (2003) suggests a theory of ‘*equivalency of interaction*’, proposing three modes of interaction, namely student-student, student-teacher and student-content, as shown in Figure 1.

*Deep and meaningful formal learning is supported as long as one of the three forms of interaction (student-teacher; student-student; student-content) is at a high level...Interaction is also fundamental to the creation of learning communities’ (Anderson, 2003, p.2).*

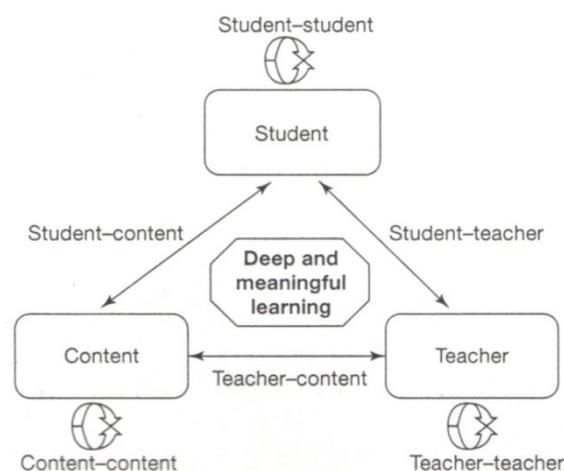


Figure 1. Equivalency of Interaction (Anderson, 2003)

From Anderson's viewpoint each of these interactive opportunities form a necessary part of the study experience yet emphasis on student-student, student-teacher and student-content can be flexible, according to individual circumstances. For this paper, which is a summary of one chapter of a doctoral thesis researching '*equivalency of interaction*', the focus is on student-student interaction, contrasting the more formal online study forum as provided by the university, with interaction via social networking. Other sections of the thesis cover student-material and student-tutor relationships but detail of these are beyond this paper's scope.

From a social constructivist view, the role of group formation and the significance of communication are vital for learning to occur. Lave and Wenger (2002) argue that learning occurs most effectively in what they refer to as a '*community of practice*', which provides support for the learner. They emphasise the importance of readily available interactive resources for the learner as, from this perspective, learning is accomplished by direct involvement, building on the acquired heritage of the community.

Forum use is an integral part of much Open University study and affords communication between a group of learners studying the same module. It is moderated and clear message threads are formed (Kear, 2001). However, there are certain limitations as, compared to social networking sites, it is not possible to see who else is online, friendship links cannot be made, there are a limited number of participants as forums are usually closed at the end of a module, and there are no quick response features such as 'like' or 'poke'.

In contrast, Duffy (2010, p.284) suggests that social networking sites can provide an alternative community of practice:

*'They enable different forms of pedagogy equally as they disable and challenge more traditional teaching and learning approaches within tertiary education.'*

He evaluates the potential of Facebook as a learning tool within tertiary education, alongside more ‘cautionary tales’ (Duffy, 2010, p.285). This paper aims to address the benefits and issues relating to forums and social networking, under the umbrella of research into social learning.

## Data collection instruments and ethics

The methodology employed a mix of quantitative and qualitative research methods. A large amount of data were generated but emphasis here is primarily on student–student interaction.

The students involved in the research were from wide range of backgrounds, ranging from those working in a technical environment, to managers, teachers, programmers and administrators. The majority of students fell in the 26-55 age range, mainly studying subjects from the Maths, Computing and Technology (MCT) faculty. Some were in full time employment, some part time, some unemployed. All were located at a distance from each other, their tutors and the institution. The issue of gender was a consideration in this study, as only 10-20% of the student sample were female. Hence data could be heavily male-biased. This was partially addressed by including interview evidence from a relatively high proportion of female contributors. Most of the students who responded connect to the Internet several times a day, leading to the assumption that online interaction was not limited due to technical difficulties.

Oates’ (2006) ethical framework was adopted for the research stages. Within the research setting, authorisation for research was gained via the Student Research Project Panel (SRPP), Human Research Ethics Committee (HREC) and data protection.

An initial study was devised as a testing ground, to help establish a picture of the current use of Open University forums and social networking sites. The purpose of the second, pilot phase, was to test the full questionnaire format and to undertake initial data analysis ensuring that data was of value to the research. Interview volunteers could be invited directly via Conconfirm (Open University questionnaire system), adhering to ethical guidelines in a more seamless manner than during the initial study, where written consent was gained via email. The main data collection phase explored more fully the research questions, gathering an extensive data set. All interviews were recorded, transcribed and anonymised. The interviews were semi-structured, ensuring key research themes were discussed utilising open questions, with maximum opportunity for presentation of emergent data. Prompts were added to each question, not seen by the interviewees, to ensure that sufficient scope was covered, and the prompts very much depended on the direction that the interview was taking.

Table 1: Research phases

<b>Research phase</b>	<b>Student faculty</b>	<b>Questionnaire tool, number of participants</b>	<b>Interview method, number of participants</b>
Initial study	Business, language, MCT	Survey Monkey, 10	Face-to-face, 4
Pilot	MCT	Conconfirm, 18	Telephone, 3
Main	MCT	Conconfirm, 146	Telephone, 14

## Analysis of results

Thematic analysis was employed to draw out key themes from the data, utilising the software tool Nvivo. Nvivo can help to move beyond merely comparing data responses to give a fuller data analysis (Leech & Onwuegbuzie, 2011).

Features of Excel were also explored for analysis of survey data as the graphical features of Excel proved acceptable for reviewing the data. Excel has a powerful tool set for visual display of data summaries.

Participants were asked specific questions regarding interaction with materials, tutor and fellow students and, as noted, the focus here is on student-student interaction.

### Student-student interactions

The Open University provides shared learning spaces, via online forums, but the advent of Web 2.0 collaborative technologies promotes a debate regarding the role that social networking can play in formal education. To explore this aspect further, the main research phase invited participants to indicate how well online spaces helped to promote a feeling of belonging to an online community, as shown in Figure 2. It can be seen that many students have indicated the ‘not applicable’ category for the interactive spaces listed, so interview questions further explored reasons for non-participation. The two main peaks where students experience the community feeling ‘to some extent’ (red) are Facebook and forums. These are both asynchronous communication methods, the main benefit being that learners can access whenever they wish (Minocha & Thomas, 2007). Further, Eisenstadt and Vincent (1998) suggest that with asynchronous communication the online learning campus is recreated whenever needed, without the restriction of organising real-time meetings. For this reason the interview questions focused on asynchronous communications.

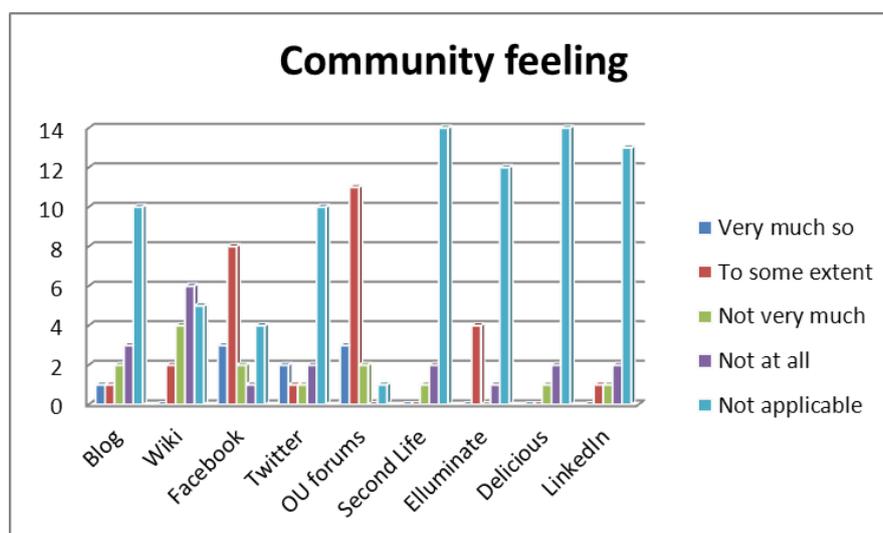


Figure 2. Asynchronous communication with significant ‘community feeling’ are Facebook and forums

The questionnaire responses helped to shape the interview questions, to explore in more detail why students appreciate particular environments, and also why many students do not wish to interact.

### Forums

From the interview data there is evidence that students find the forums, provided by the Open University, a safe space as *'you're dealing with other students, nobody else can access that.'* Enjoying the *'camaraderie'* was also cited. As Figure 2 indicates, many students do value the interactive opportunities provided by the university, yet analysis of actual forums suggested underuse, particularly after initial activity at the start of study.

Reasons given for non-participation included anxiety in posting, difficulty in finding relevant information and sudden closure of the interactive space. For example, one student commented that she was *'afraid of putting a comment on yourself in case somebody came along rubbishing it'*, and another noted *'I always mostly never post questions myself unless I'm asking something I know about'*. Further, the student noted that certain comments posted resulted in her leaving the forum entirely, saying *'I didn't enjoy [OU forums]... Not having what they have doesn't mean I'm wrong. So I stopped using that forum.'*

Students also expressed concern regarding the content of messages within the forums. Difficulty was noted in finding relevant information amongst the *'simplistic chit-chat'*, and items of academic interest were *'scattered between a whole load of other stuff'*. Again this could lead to infrequent use the forum, as a particular student noted *'You drain through acres and acres of rubbish and occasionally you find a little nugget. I really regard them as a last resort'*

Concern was also expressed about the very abrupt closure of specific forums, noting that *'they shut it down very quickly, so we couldn't share results...yes... you're just cut off'*. A further student expressed a desire for *'... a forum where you could go after an individual course that might give some continuity'*. These difficulties can be partly alleviated via the less formal 'café' type forum, which tend to remain open for longer periods, and have larger student populations. Students reported appreciating the *'general type discussion forum, not restricted to tutor group'* and a place to *'ask somebody about anything to do with studying'*. Another noted that it was possible to *'sort of pop in just to see if there's something you need to know, rather than something you want to ask'*. However, there is still the restriction of cafes often opening and closing for a restricted time period, something that is not the case with social networking.

### Social networking – Facebook

Students tend not engage in collaborative activities unless they see a tangible benefit (JISC, 2008). A possible benefit to linking with fellow students in an informal social networking space is that the network is already well established. Facebook has over one billion global users (StatisticBrain, 2014) and there is potential to form specific groups within that network. One

of the interviewees commented *'I do link with other students on Facebook, more socially than work based at present, but it does offer a good platform for both'*.

Analysis of interview data suggested a perception that when compared to forum use, where students are allocated to a specific group, social networking is *'a natural form of communication with their peers'*. There may be a feeling of increased ownership of learning as *'...it takes it away from being you know, an OU – run forum, the less official nature of it I suppose'*.

Most of the interviewees who did not interact via social networking could see the potential of using an already popular platform, for example one student stated *'If the majority of students on a particular course were also on Facebook, then I could quite well see how I might use Facebook instead of, er, a steady specific forum'*. The simplicity of linking to others was mentioned, and the relative ease to *'sometimes add a group, like people who are on the same OU courses as me'*. The general perception was that this could increase potential networking opportunities, with students valuing *'any way of being able to interact with other students'*.

However, as with forums, certain problems with social networking sites were noted, such as *'in social networking you can put what you want and not what is actually true'*, with a suggestion that *'...these things must be monitored because you need to know what sort of information is put on there'*. As social networking spaces tend not to be formally moderated by the Open University there is a real danger of errors not being corrected. Distractions could also be viewed as a threat *'because to try and study and to try to connect to these social networking sites, and these things in general, you'd never get any study done (laugh)'*. There were also reservations regarding the necessity of a separate Facebook page, as one student *'thought what's the point'*. Another noted privacy issues, saying *'I'm very reticent about releasing information'*. Unlike forums, where membership, but not participation, is often compulsory, social networking is entirely a student's personal choice.

### Conclusions and implications for practice

- Not all students want to interact, but few have any objections or concerns if others do and this extends to social networking sites.
- Although the questionnaire data suggested forums are valuable, observation of actual forum activity indicates that they are underused.
- Forums, as provided by the university, are valued by the students but tend to be underused. Forums work well in a formal monitored environment, but there should be a social space to encourage participation.
- Interview data revealed that forums could be seen as controlled, driven by the module content and have an obvious tutor presence.
- These factors could inhibit the more emergent type of learning that would enhance the social learning experience.
- Social networking can help promote student ownership of their learning.

There is potential for networking and dynamic group forming, possibly less anxiety in posting about study-related issues. Those students with reservations about this joining social networking sites, such as privacy issues, could see no particular reason why this should not be an option for those who wish to study in this way.

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## Evaluating Web Connectivity for Adult Distance Learners – Facebook or Forums?

Christine Gardner

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## MEASURING IMPACT OF USING E-LEARNING PORTALS ON EDUCATIONAL SYSTEMS

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### Abstract

Technology Enhanced Learning (TEL), Open Educational Resources (OER), innovative learning paradigms, educational scenarios and the associated digital technologies, environments, applications and content are continuously changing and rapidly evolving nowadays, thus affecting not only the effectiveness, the impact and the cognitive outcomes of teaching, but also the quality of the learning process as a whole. The impact of TEL environments and portals using OER can be evaluated in terms of usability, effectiveness and pedagogical use. Impact evaluation has always carried great potential for improving learning outcomes and tailoring learning toward the users' needs, motivation, satisfaction and expectations. However, assessment of the impact of the use of teaching and learning resources, environments and portals in a systematic manner has proven to be difficult. The research work described in this paper attempts to assess the impact of using Open Learning Resources in a shared and distributed way, on an innovative portal, namely the "Open Discovery Space" (ODS) portal. In this European example case, there are different dimensions of impact to consider, including impact on teachers, students, stakeholders, schools and the educational system at large. The focus of the impact evaluation in this research is to understand how best such TEL environments are to be accommodated, adopted and used within the educational processes, and how well they can fit within the current national/regional curricula and educational systems.

## **Introduction**

The role of Information and Communication Technology (ICT) in Education has undergone drastic changes since the beginning of the Internet era. The modern web-based open learning and education tools have transformed mechanisms of teaching and learning (Stergioulas et al., 2014; Alian & Al-Akhras, 2010; Finlayson et al., 2006). Together with changes in teaching practices, there is also an increase in the demands of the stakeholders (schools, teachers, learners and their parents, society, etc.) involved in such educational processes (Haddad & Draxler, 2002; Harrison et al., 2002) for high-quality teaching and a constructivist and critical learning process. Another current issue is that TEL has overlooked the need for developing the learners' skills in order to constructively build on the mass of information that they can easily access by using technology, as well as the possibility to apply critical-reflective and creative thinking (Fragkaki & Stergioulas, 2014). Therefore, evaluating the impact of ICT-based educational tools has become crucial for satisfying stakeholders' needs and for modernising the educational institutions (Kozma, 2005).

In the context of educational ICT systems and portals, many studies have been limited to showing the efficiency of ICT-based teaching and learning tools only compared to traditional classroom-based teaching and learning approaches (Comber et al., 2002). However, apart from a very small number of studies (e.g. Ga-Jin, 2007), there is a scarcity of research carried out on the assessment/evaluation of the impact of the systems themselves or their efficiency (Alkhalaf et al., 2012).

This paper aims to discuss the evaluation of the impact of using an innovative and open-source portal, namely Open Discovery Space<sup>1</sup>, on teachers, learners, schools and educational systems, and show some preliminary results. It is organised as follows: Section two introduces the impact assessment of ODS. Section three briefly outlines the impact assessment methodology applied for the purpose of this research. Section four shows some of the recent preliminary impact measurement results. Section five summarises the research and discuss the results of the research so far.

## **Impact Assessment of the ODS Portal**

The ODS EU project aims to provide a socially empowered multilingual innovative eLearning portal, based on an Innovation model that contains three core phases of activities: stimulating, incubating and accelerating. Educational design in ODS is performed by teachers and educational professionals who aim to facilitate the interaction between learners, resources, scenarios and tools for educational purposes. They are typically employed at primary or secondary schools, or work in organizations with an educational mission such as museums and science centres. Parents have a somewhat related role as they are responsible for the general upbringing of the learners. A consortium of 51 participant organizations is

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<sup>1</sup> [www.openddiscovery.eu](http://www.openddiscovery.eu)

responsible for the co-design and co-development of the ODS pedagogical and instructional framework<sup>2</sup>.

Impact assessment of an eLearning portal, such as ODS, necessarily involves evaluation and assessment of educational aspects that directly relate to the context of the teaching and learning activities. For this reason, the results of such assessment can be used as a basis to improve the educational system. This type of assessment contrasts with traditional approaches, which focus on a limited number of factors and are usually used for grading and accountability purposes. Thus, our impact assessment methodology considers various impact factors including motivation factors, engagement, empowerment, involvement, satisfaction, accessibility, availability, usability, effectiveness, achievement, performance, sharing, interaction, communication, collaboration, on-going support, innovation, training, creativity, search facility, socialising, culturally and linguistically appropriate features, etc.

The objectives of the impact assessment activities are to discover the nature and extent of effects and changes, and demonstrate the outcomes on the micro-level stakeholders, including on individual teachers, learners and schools and the macro-level stakeholders, including regional, national, and EU-level stakeholders, and also policy makers. In this context, it is expected that identifying and measuring the actual impact that a portal like ODS has on educational systems will help stakeholders to fully exploit the strength of such portals and will facilitate improvements in terms of the application of digital technologies in educational systems and in their everyday educational processes.

### Summary of the Research Methodology

This section introduces the research methodology of this research. This methodology is grounded on the ODS impact assessment framework developed as part of this project. This methodology has been thoroughly explained in recently published research work (Fakhimi et al., 2014). The ODS impact assessment methodology involves a mixed (Quantitative-Qualitative) approach that has been adapted mainly from the studies conducted by (Scheuermann & Pedro, 2009; Wang et al., 2007), the EFI framework (Stracke, 2012), as well as from other EU and international projects.

The knowledge gathered from existing literature has been used for the formation of an impact assessment methodology, which including indicators and questionnaires specifically tailored to the ODS portal community's impact assessment needs. More specifically, indicators and parameters to measure the impact of ODS on educational systems are derived from existing literature in an empirically validated instrument and from the objectives and activities of ODS. The methodology will also be of great value to any online learning portal stakeholders by enabling them to identify various aspects of the system and investigate the link between the impact of eLearning systems and its drivers. The indicators selected for measuring the impact

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<sup>2</sup> [http://opendiscoveryspace.eu/sites/ods/files/d4.1\\_the\\_open\\_discovery\\_space\\_educational\\_design.pdf](http://opendiscoveryspace.eu/sites/ods/files/d4.1_the_open_discovery_space_educational_design.pdf)

of ODS portal follow the SMART criteria (Doran, 1981) and include “Key Performance Indicators” (KPIs) (Ishizaka, 2013).

A questionnaire/survey was prepared based on impact indicators. The impact assessment quantitative survey includes a five-point scale / Likert based questionnaire with equal scores for each question and different weight factors for each choice. The presented research results were derived from responses to a questionnaire survey from 390 teachers across 23 countries across the Europe engaged in various ODS activities. Questionnaires were translated into 13 different European languages spoken across the Europe. Among the participants in the surveys, approx. 52% were female, and 27% were Male teachers, while the rest of the participants (approx. 21%) were not willing to disclose their gender in the survey. The surveys were conducted from January 2014 till June 2014 – almost two years after the start of ODS project – and the data was analysed using basic descriptive statistics and factor analysis, and relationships within the dataset were examined using logistic regression techniques.

## **Results**

### ***Impact of using ODS on Educational System and Learning processes***

There are similarities between teachers’ use of ODS and their perceptions of its impact on students and learners. 58% of participants have mentioned that they agree/strongly agree that using ODS has enabled them to provide a better learning experiences for their students. Approximately 60% of teachers also agreed/strongly agreed ODS had helped make students more effective at strengthening their knowledge. The large majority of the participants (81%) felt that introducing ODS motivated their students to apply more digital and ICT-based tools and resources for their studies (Table 1).

Table 1: Teachers view on the impact of ODS portal on educational system

Questions	Strongly Disagree %	Disagree %	Neither Agree or Disagree %	Agree %	Strongly Agree %	Cannot Answer this question %
ICT-based or ICT-integrated learning is integrated in my school.	2%	11%	14%	45%	25%	3%
Using the ODS portal enables me to provide a better learning experience for my students	2%	3%	14%	40%	18%	23%
The added value of using ODS for my students are high.	0.2%	2%	19%	37%	22%	19.8%
It is possible to integrate ODS in my current curriculum	2%	4%	15%	37%	23%	19%
ODS offers resources which help me in personalising learning for diverse learners	1%	2%	23%	34%	15%	25%
The students in my classes are motivated to use digital educational resources	2%	1%	7%	44%	37%	9%
There are enough national institutions and departments (in ministries, education centres, school boards, universities etc.) supporting and advising you in the use of innovative teaching approaches and in using Digital Educational Resources	4%	20%	27%	31%	9%	9%
My students use ICT tools at home e.g. for homework	1%	4%	15%	42%	27%	11%
Improved my teaching approaches.	3%	4%	16%	30%	38%	9%
Digital educational resources on ODS fit to my local condition	9%	12%	26%	30%	19%	4%

ODS has also had a positive impact on some aspects of learners’ ability to independently and autonomously manage their own learning. Nearly 70% of respondents felt that students were more motivated to work independently using various ICT based resources and tools from home, as a result of ODS use.

The majority of teachers who were surveyed (73%) mentioned that they had sufficient access to and familiarity with using ICT-based tools like ODS to plan, prepare, share materials and communicate with learners and other teachers. They were also satisfied with the support provided in relation to technical support and training. They were also pleased with the dependability of ICT equipment and infrastructure and, even more satisfied with the trainings provided to familiarize them with incorporation of ODS into teaching and learning (Figure 1).

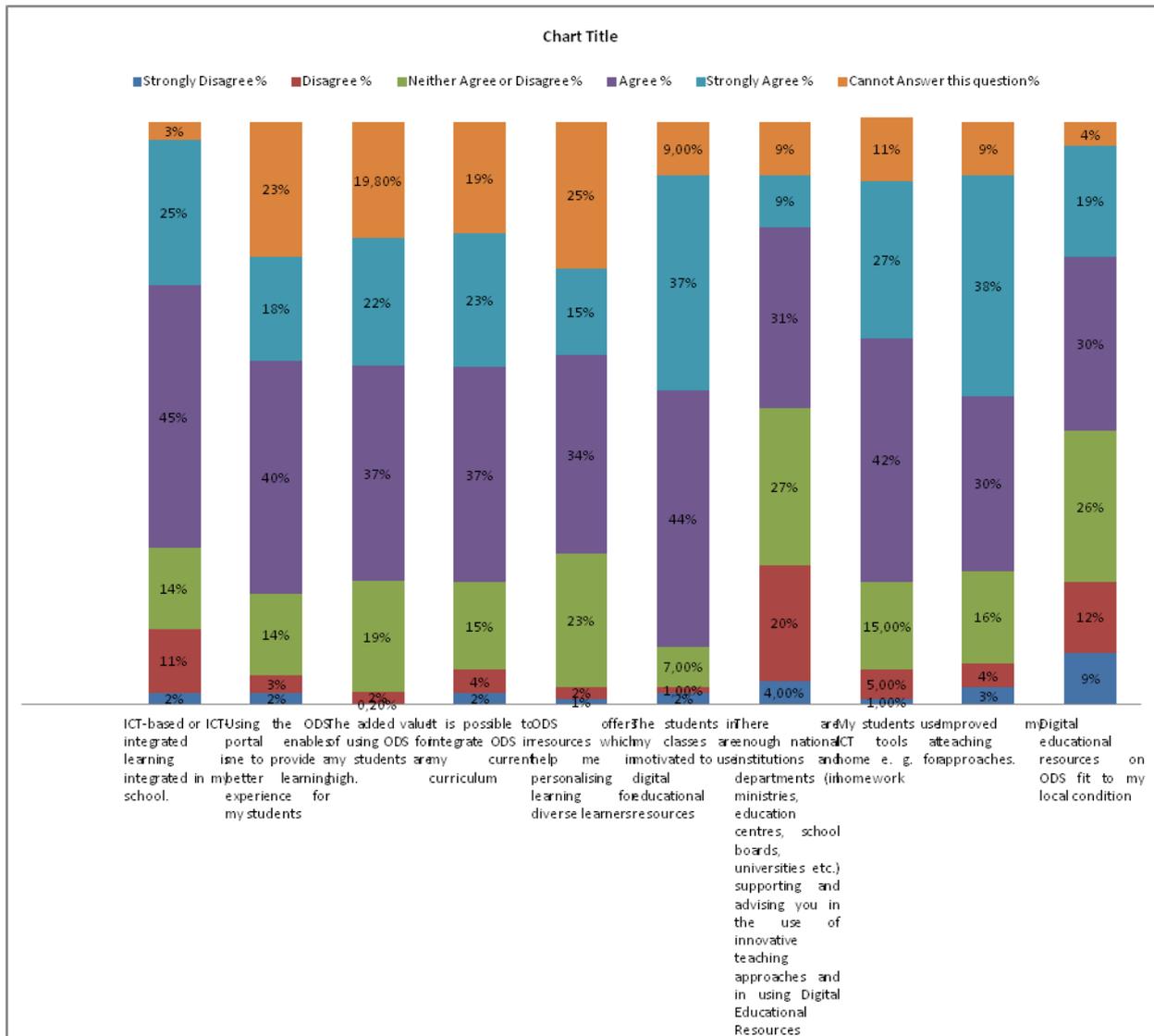


Figure1. Impact of ODS

### Measuring the ODS relevance to National/Regional Curricula

Measuring the relevance of any ICT based or ICT assisted learning tool to the national/regional curricula is a complex task, since the term *national curriculum* is used in different meanings. The national curriculum might be a “*core curriculum*”. The “*core curriculum*” (in some countries “*frame curriculum*”) is some form of an official, compulsory skeleton of the necessary knowledge base of a pupil completing upper secondary education: the whole vertical primary/ secondary education system of a region / state / country. This defines the necessary skills and competencies the pupils have to attain at different levels of education in the different subjects. In general, the subjects (or fields of knowledge) are also defined in the *core (frame) curricula* (West et al., 1999).

- (i) In other cases, the national curriculum also specifies the content.
- (ii) In both cases, the school might have some freedom in preparing the local school curriculum. If the school has got this freedom the educational authorities often define how many percentage of the

curriculum could deviate from the core (state-wide / national / regional) curriculum. (iii) In extreme cases the national curriculum specifies the competence levels, the content and even the textbooks to be used at different grades. Therefore, we first run a short survey asking the teaching community about the structure of the national / regional curricula, with questions concerning the regulatory environment controlling the competence and content requirements embodied in the national/regional curricula of the specific country /region. The general conclusions showed that:

1. National curricula exist in all 13 countries responding. In a few cases, however, it is to be adhered to only in state schools.
2. The majority of countries use some form of a pyramid like control structure, in which the lower level should satisfy the requirements of the upper level, but might supplement it with additional content/requirements. In some countries the national curricula defines also the content and the textbooks to be used. If the curriculum is that detailed, the school has no flexibility at all, i.e. the school curricula is the same as the national/regional curricula.
3. The control structure (in the countries following the pyramid-structure) is multi-level, typically with 3 levels: national (controlled at government level), a medium level, controlled by a relevant education authority and a lower level, controlled by the school / municipality / council.
4. If the school curricula are set at a lower level, the flexibility varies between 10 to 40%, depending on the country and the subject. 77% of the respondents answered positively to the flexibility question, although the typical flexibility was only 10%. This gives space for innovative solutions in education.

In parallel to the above pre-survey, the results of the survey on the impact of using ODS on educational system and learning processes was also evaluated, yielding the following conclusions: In addition to teacher's personal experience of the impact of ODS on their teaching approaches, majority claimed that *ODS is aligned with their curricula* and it had potential to contribute to teaching and learning in future. In particular, teachers had positive approach towards portals like ODS to *increase flexibility in learning provision* in order to prepare learners for future employment. Over 60% of teachers were positive (agree/strongly agree) toward the possibility of *ODS integration with their current curricula*. Additionally, 70% of participants also agreed or strongly agreed that ICT-based or ICT-integrated learning is integrated in their school.

In summary, most teachers participating in the survey indicated that they were confident in their pedagogical use of ODS to plan and prepare lessons, to communicate with learners and other internal and external teachers. The majority also claimed that resources and services provided by ODS are aligned with their current curricula. However, relatively fewer (less than 50%) indicated that they were confident using ODS to personalise their teaching methodologies. Our findings shows that the extent and nature of ODS impact on educational system and measuring its relevancy with curricula were associated more with teachers'

attitude and use of ODS than with contextual factors. The evidence suggested that there was a relationship between the teachers attitude towards using and accommodating ODS with their current curricula and teaching methodology. This was the main reason to motivate and stimulate their students to use ODS more effectively and hence to improve the ODS impact on their school and ultimately on the educational system. Last but not least, taking into account the structure of the national / regional curricula of the different countries / regions, in following survey we will try to differentiate between the impacts on various curricula levels, and on the education system of that specific country / region. We have to keep in mind that education in Europe is a national competence, but the equivalence of the grades attained by the students requires some harmonisation. Figure 2 shows the competence level of ODS teachers. The teachers understanding ICT in education and professional development is significant high.

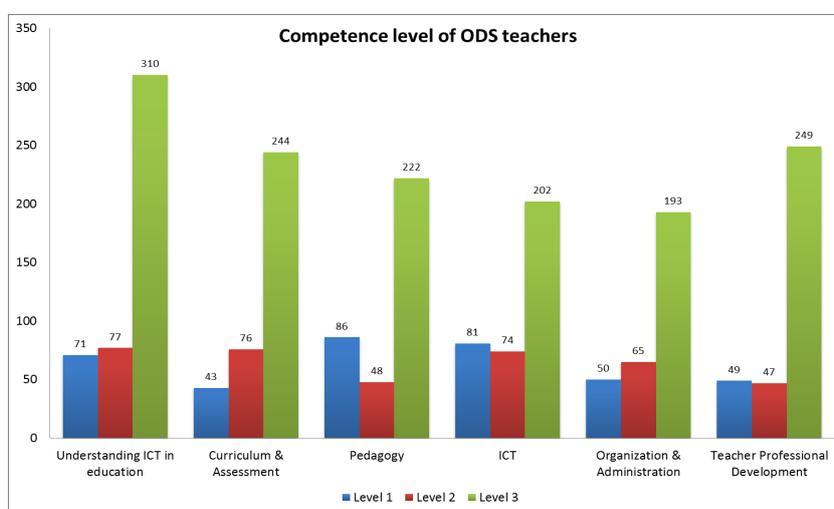


Figure 2. Competence level of ODS teachers

## Discussion

This research is aimed at evaluating the impact of an innovative e-learning portal, namely Open Discovery Space (ODS), on educational systems in the schools across the Europe. To achieve this, this research aimed to evaluate how best the portals and services like ODS are to be accommodated within existing teaching and learning processes as they are seen by teachers and learners. This research was just covering part of the assessment and the final assessment results are expected to be made available to the research community on a continuous basis.

Taking into account the early results of this research, It seems that the use of an e-learning portal like ODS, in EU Educational Systems has a great impact on the whole system and on the learning processes, and has the potential to greatly improve the quality of the work in schools. Such an initiative is generally suitable for a large area of teaching practices, while it enables the accomplishment of the daily tasks easily and it offers a wide range of useful and updated learning resources. Furthermore, ODS is aligned with the learners' curricula and it has the potential to contribute to teaching and learning in the future. Therefore, to be able to evaluate the impact of the portal on educational systems across the EU, requires further data

collection of various Key Performance Indicators (KPIs) from different stakeholder's perspectives

Further work is currently planned in order to benchmark the results with previous studies, in order to conduct the qualitative research effectively and detect trends / patterns, and improve the reliability of ODS impact assessment survey results over time and across multiple assessment tools and instruments.

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## **A MURKY BUSINESS: THE ETHICS OF CONDUCTING EDUCATIONAL RESEARCH IN FACEBOOK GROUPS**

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### **Introduction**

Facebook is undoubtedly the face of online social networking and remains ubiquitous. A 2011 study by Harvard University (2011) reported that 90% of four-year undergraduate college students had Facebook accounts at that time and of late there has been an upsurge in academic arguments for the more purposeful use of social media, especially Facebook, as an educational tool (Tess, 2013). Tess (2013), in his comprehensive literature review on the role of social media in higher education, asserts that ‘the ubiquity of social media is no more apparent than at the university where the technology is transforming the ways students communicate, collaborate, and learn’ but also points out that ‘empirical evidence ... has lagged in supporting the claim’.

Of the studies which do offer empirical evidence, several stand out. Tess (2013) lists many in his literature review, while Pander et al. (2014) offer a similarly valuable, more recent literature review that. Several notable studies are worth mentioning. For example, Meisher-Tal et al. (2012) provide a systematic account of the use of Facebook groups as LMS while O’Bannon et al. (2013) examine the effectiveness of using Facebook groups to increase pre-service teachers’ knowledge of core technology topics. Bruneel et al. (2013) look at the educational use of Facebook with a focus on privacy issues, de Villiers and Pretorius (2013) conduct an heuristic evaluation of collaborative learning in Facebook and the ways in which Facebook groups can foster relationships between formerly isolated distance learners, while Bosch (2009) compares student activity in Facebook groups with that in official institutional sites.

Several studies focus on the use of Facebook in particular educational disciplines. For example, Lieberman (2013) researches the use of Facebook as a learning environment by political studies students while Whittaker focuses on Facebook’s use to create an online learning community in an undergraduate science class. McCarthy (2010) steps beyond disciplinary boundaries to offer broader research into Facebook’s use with first year undergraduates as a tool for developing preliminary relationships between them and Donlan (2012) explores students’ views on the use of Facebook groups in university teaching and learning, with a focus on student autonomy and control. Wang et al.’s (2013) study has been particularly influential, concluding that Facebook use in educational contexts assists students

in achieving better grades, higher engagement, and greater satisfaction with the university learning experience.

This paper both builds and expands on the body of research looking at the use of Facebook in educational settings by taking as its focus the ethical challenges of researching within Facebook – a topic that receives little attention in other research studies, but which recently sparked a great media furore when scientists conducting a psychological experiment including approximately 700,000 Facebook users manipulated news feeds to examine the effects of positive and negative posts (see Broaddus, 2014). Indeed, some recent Facebook-related educational research, including some of the studies mentioned above, employ practices that may be deemed ethically questionable. We argue here that while Facebook groups appear to offer rich pickings for the researcher, especially in domains labelled as ‘public’ or ‘open’, which offer a tempting wealth of off-the-peg data in the form of members’ posts and interactions, a variety of ethical dilemmas confront the researcher who is prepared to interrogate their own practice, to consider the true nature of openness and privacy, and to critically engage with the impact of researching in a social media context. The demands of negotiating these challenges must, therefore, be weighed against the likely value of any research findings.

## **Background and methods**

This paper is informed by our own reflexive research on the behaviour of formal and informal learners both in online forums and in Facebook groups. Since 2011 we have been working with online learner communities outside formal education when developing and piloting the ‘public open scholar’ role (Coughlan & Perryman, 2012), aiming to increase awareness of open educational resources (OER) and to disseminate information about the resource needs of people outside academia. The public open scholar role involves open academics working with online communities beyond formal education who might benefit from OER, identifying members’ expressed needs and then sourcing OER to meet those needs. As such, the role builds on Weller’s ‘digital scholar’ persona – ‘someone who employs digital, networked and open approaches to demonstrate specialism in a field’ (Weller, 2011, Chapter 1). We piloted the public open scholar role in 2011 within UK voluntary sector online welfare communities who were using online forums for information sharing and peer support (see Coughlan & Perryman, 2012) and in 2013 we took the public open scholar into Facebook (Perryman and Coughlan, 2013) to reach an international audience of autism-focused Facebook groups in India, Africa and Malaysia, with a combined membership of over 5000 people.

In 2014 we broadened our study of Facebook to include researching formal learners participating in 10 public Facebook groups about specific courses from our employer the UK Open University (OU), with a combined membership of approximately 3000. The bulk of these members are undergraduate students, but some groups also include alumni or prospective students interested in finding out about a particular course. We chose OU groups because we are familiar with our own institution’s organisation, structure and terminology.

Our research findings from this study of OU Facebook groups are yet to be reported in detail. However, our key conclusions are set to make a significant contribution to understanding the use of social media in the context of formal education. For example, our research showed that Facebook groups can be a valuable form of open practice, with university students making a big contribution to their education by self-organising Facebook groups. As such, this evidence has the potential to shift the focus of the open education movement from researching students as co-producers of objects to exploring the ways in which students co-develop educational processes. On the basis of our findings we recommend that universities could usefully review the role of VLE forums (e.g. Moodle) within undergraduate tuition strategies and consider the extent to which Facebook groups might sit comfortably alongside the remainder of the learning experience.

For this paper, however, we move from considering the educational practices of learners within Facebook to an examination of the practices of the researcher, and their ethical implications, asking the overall research question ‘what are the challenges of researching social network activity in an educational context?’. This is an under-researched and complex area, covering such questions as:

*What ethical obligations do researchers have to protect the privacy of subjects engaging in activities in “public” Internet spaces? How is confidentiality or anonymity assured online? How is and should informed consent be obtained online? ... Is deception (pretending to be someone you are not, withholding identifiable information, etc) online a norm or a harm? (Buchanan & Zimmer, 2012)*

## **Findings and implications**

We have divided our discussion to cover ethical considerations arising in three phases of the research process: beforehand, during and afterwards. In interrogating the ethical challenges connected with researching in Facebook we began by consulting The Open University’s research ethics policies (Open University, 2006) in addition to the ethical guidelines for educational research produced by the British Educational Research Association (BERA, 2011) and the American Educational Research Association (AERA, 2011), following Zimmer’s (2010, p.324) assertion that ‘concerns over consent, privacy and anonymity do not disappear simply because subjects participate in online social networks; rather, they become even more important’ and that ‘it is our responsibility as scholars to ensure our research methods and processes remain rooted in long-standing ethical practices’. We then cross-referenced these guidelines with the growing body of literature dedicated solely to the ethics of researching online (e.g. Buchanan & Zimmer, 2012; Convery & Cox, 2012; Markham & Buchanan, 2012).

## ***Beforehand***

Based on our own experiences of researching with Facebook groups, we argue that the researcher needs to carefully consider the potential ethical challenges of performing educational research in a social media context well before embarking on the process, anticipating possible findings and how to deal with them.

### *Informed consent*

Informed consent is frequently stated as a vital component of ethical educational research. The BERA Ethical Guidelines (2011, p.5) state that ‘researchers must take the steps necessary to ensure that all participants in the research understand the process in which they are to be engaged, including why their participation is necessary, how it will be used and how and to whom it will be reported’. The BERA Guidelines do concede that ‘social networking and other online activities...present challenges for consideration of consent issues’ but maintain that ‘the participants must be clearly informed that their participation and interactions are being monitored and analysed for research’.

### *Public and private*

Related to the topic of informed consent, the distinction between public and private research settings appears pertinent to researching Facebook groups, of which three categories exist – public, closed and secret. Our current research is only examining Facebook Groups, which are one of the three main facilities within Facebook. The other two are Pages, which are always public, and individual accounts, which provide users with a range of customisable privacy settings. There are at least five million Groups within Facebook.

Convery and Cox (2012, p.51) state that ‘one of the central issues with [Internet Based Research] is what constitutes ‘public’ and ‘private’ spaces, with corresponding implications for whether or not informed consent is required’. The BERA (2011) Guidelines do not cover this distinction between public and private. However, Zimmer’s (2010) widely-cited study of the ethics of researching in Facebook, which focuses on the controversial ‘T3’ study of Harvard students’ Facebook use, is more helpful. Zimmer suggests that while the use of data that is solely available from public Facebook pages (e.g. students’ profiles) may be seen as ethically defensible, a different picture emerges where this data is then cross-referenced with institutional data accessible only to people within that institution, and that the public Facebook data then becomes semi-private and, in turn, should be subject to more rigorous ethical treatment.

The AERA Ethical Guidelines (AERA, 2011, p.151) make explicit reference to the ethical treatment of public data, stating that ‘education researchers may conduct research in public places or use publicly available information about individuals (e.g., naturalistic observations in public places, analysis of public records, or archival research) without obtaining consent’. To some, online social networking in the public sphere can easily appear as a ‘snoop’s dream’ (Marks, 2006) in which participants’ contributions to online discussions are exploited for

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*Leigh-Anne Perryman, Tony Coughlan*

other' gain, be it commercial, financial or even criminal. However, we argue that the responsible, reflexive researcher can conduct ethically defensible research in such spaces as long as they look closely at what might constitute public and private communication in itself, irrespective of the extent to which the context in which such communication takes place is public or private.

Our own research has featured two distinct approaches. When researching a combination of public and closed Commonwealth Facebook groups on autism we gained informed consent from participants by joining each group and then contacting the group moderator to ask them to raise the matter with group members on a collective basis whereby members were invited to raise an objection if they did not wish the group to be the topic of research (none objected). We used the same approach across all groups, irrespective of whether they were public or closed. After conducting the research, we published the findings under an open licence and made them accessible from one author's own Facebook page (<https://www.facebook.com/freeCYPmedia>) and blog site (<http://cyp-media.org>) so that group members could read what we had found, in line with BERA and AERA guidelines that research reports should be shared with participants.

Latterly, when investigating solely public (previously known as 'open') OU Facebook groups, we have not negotiated group consent, as allowed by the AERA Ethical Guidelines above. We are anonymising our findings and are again openly publishing them and making them easily accessible from the author's Facebook page and blog site. By saving the time involved in negotiating consent public/open groups are easier to research than closed or secret groups, although we estimate that public/open groups represent less than 10% of the total number of active OU-related Facebook groups, the remainder being either closed or secret. (Closed groups are discoverable by searches; the viewer can see who the members are, but cannot see the content without joining. Secret groups are not discoverable, so it is difficult to know how many exist.) These closed/secret groups potentially offer rich research data that could help to extend the validity and generalisability of our research findings, and its overall value to stakeholders such as learners, educators and The Open University as an institution. However, negotiating consent with closed and secret groups dramatically increases the time and effort involved in researching, which one has to be confident that the outcomes will warrant. A complexity is raised by the fact that groups' status as public/open can change. Indeed this is quite common in the life-cycle of a group; they are often set to 'public' initially to help students discover them, then closed once all the cohort that wish to have joined.

### *Disclosure and risk to participants*

When researching within one's own institution the researcher needs to be clear about the responsibilities and obligations connected with their employment, in advance of conducting research in social media setting. The Facebook environment has been reported as particularly conducive to 'confessional' activity and 'online disinhibition' (Joinson, 1998; Suler, 2004), displaying the six factors that Suler (2004) identifies as prompting people to self-disclose online more frequently or intensely than they would in person: dissociative anonymity,

invisibility, asynchronicity, solipsistic introjection, dissociative imagination, and minimization of authority. Consequently, the researcher may encounter evidence of plagiarism, disclosure of other types of poor academic practice, or indeed anti-social behaviour on the part of formal university students (e.g. complaints about named individual tutors). While it may be tempting to adopt the position of a detached observer, institutional guidelines may require the researcher to report such practice. Indeed, the BERA Ethical Guidelines (2011, p.8) state that:

*“Researchers who judge that the effect of the agreements they have made with participants, on confidentiality and anonymity, will allow the continuation of illegal behaviour, which has come to light in the course of the research, must carefully consider making disclosure to the appropriate authorities. If the behaviour is likely to be harmful to the participants or to others, the researchers must also consider disclosure.”*

### ***During***

A key challenge during the research process was managing ethical considerations around whether to join the Facebook groups that we researched, and whether to disclose our status as researchers and the fact that we were researching specific groups. Again, the distinction between public and private research spaces becomes relevant here.

#### *Joining groups and status disclosure*

To conduct any research about Facebook groups, one needs an individual Facebook account. If desired, one can then join up to 6000 groups. One benefit of joining is that the researcher gains access to an enhanced layer of information about device/client use and members' locations. When conducting our Commonwealth Facebook autism group study we did join each of the groups that we researched and, indeed, disclosed our identity as researchers. However, we have not joined the 10 OU Facebook groups that we have been researching more recently as all of the data that we needed was available without joining the groups, neither did we disclose our status as researchers. Our position is that as we are conducting observation-only research on passive participants in the public sphere (participants who are not being interviewed, conducting surveys nor are the subject of interventions or AB testing), it is ethically defensible to neither join the groups we are researching, nor disclose our status as researchers.

#### *Data protection*

While researching, data protection and record-keeping also has to be considered. The BERA Guidelines (2011, p.8) state that ‘researchers must ensure that data is kept securely and that the form of any publication, including publication on the Internet, does not directly or indirectly lead to a breach of agreed confidentiality and anonymity.’ Returning to our own research context, it is not possible to download Facebook group activity wholesale, so accurate record-keeping is particularly important to ensure the research can be completed and verified

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if necessary. In our own research we have limited ourselves to counting and analysis of qualitative data; no names are attached to this and data is fully coded and anonymised (e.g. ‘group 1, member A’). A further reason for keeping accurate records is that Facebook can be quite a fluid and transitory medium – for example, whole groups can be deleted, which typically happens after the end of a course – and as a business, Facebook change their facilities and rules frequently for commercial reasons (e.g. withdrawal of email function & changed privacy settings).

### *Breaking Facebook’s rules*

The existing research on the educational uses of Facebook raises a further ethical issue – that of creating duplicate, or ‘faux’ accounts as a researcher and of encouraging research participants to do the same. For example, while Facebook explicitly states that creating duplicate accounts is against its rules (Facebook, 2014), current figures for fake accounts estimate that 83 million such accounts (8.7% of Facebook’s active users) exist (US SEC, 2012). This is problematic in terms of mutual trust and member safety, and for the researcher is troublesome where research includes demographic comparisons (for example, an apparently middle-aged male Facebook member may actually be a young woman, and vice versa) or where the researcher is doing quantitative analysis of the number of posts made (for example, posts may be made by a single person using several fake accounts). Arguably, then, Lieberman’s (2013) suggestion that students might create a separate account for their scholarly work, and that she had done the same, raises questions both about the veracity of her research findings and about the ethics of encouraging (at worst) possible duplicity and/or the creation of duplicate accounts that might undermine the validity of the research findings. (It is worth noting though that Lieberman states that ‘not one of the students chose to set up a dedicated account for university business’ (p.27).)

### **Afterwards**

Reporting the findings of a social-media located research study after it has ended raises a further set of ethical considerations regarding confidentiality and the potential impact on research participants, be they active or passive. Krotoski (2010) makes a distinction between protecting the individual and protecting the online community as a whole when researching in online communities such as Facebook groups.

### *Protecting the individual*

Holmes (2009) suggests that in general, most online research involves minimal risks to individual participants, aside from breaches of confidentiality and when questions asked by the researcher provoke emotional reactions. While the latter is not relevant for research where participants are passive and no interventions are involved, the issue of confidentiality remains. The BERA (2011, p.7) Ethical Guidelines state that:

*“The confidential and anonymous treatment of participants’ data is considered the norm for the conduct of research. Researchers must recognize*

*the participants' entitlement to privacy and must accord them their rights to confidentiality and anonymity, unless they or their guardians or responsible others, specifically and willingly waive that right".*

As previously discussed, however, the public nature of many Facebook groups might suggest that different ethical considerations apply than when researching in private settings online. Again, the AERA (2011) Guidelines do make a distinction between ethical requirements of researching in public and in private contexts, stating that:

*"Confidentiality is not required with respect to observations in public places, activities conducted in public, or other settings where no rules of privacy are provided by law or custom. Similarly, confidentiality is not required in the case of information from publicly available records."*

We tentatively argue that data in public Facebook groups falls into this category of public setting, though we do acknowledge the researcher's obligation to navigate the complexities of unintentional disclosure resulting from online disinhibition and to consider the possibility that passive research participants could be harmed when a researcher (especially one connected with the same institution attended by the passive participants) begins analysing and reporting research data that has been unintentionally disclosed. We suggest that while the public domain of the Facebook group does not in itself offer anonymity, researchers' reports should anonymise all data cited as evidence and that, with the exception of research where discourse analysis is integral to the research strategy, it could be helpful to paraphrase quotes where the topics discussed are potentially sensitive, to help prevent Internet searches that will lead back to the research participants.

A further complexity emerges when researching closed/secret groups, when the researcher must consider the extent to which it is ethically defensible to report evidence from these groups. We argue that when conducting research in such groups it is important to gain the informed consent of participants, whether active or passive, and that when such consent has been obtained reporting data gained from such groups is less problematic, subject to the same care exercised above.

### *Protecting the online community*

Risks to the online community being researched may also result from both the research process itself and from disseminating research findings. Krotoski (2010, p.3) suggests that:

*"Online communities are complex social negotiations between disproximate individuals who are engaged in what William Gibson described as a 'consensual hallucination' (1984). Distinct from non-community online interactions, members of these groups form interpersonal systems over time and through repeated [interaction] that result in stable governance and hierarchy, featuring rules, regulations and distinctive norms."*

Arguably, reporting a close analysis of interaction within a Facebook group (whether closed, secret or public), when read by group members, could change the nature of relationships within an online community, with the potential to undermine its stability and effectiveness (although, admittedly, it is also possible that the reverse could occur, with the group being strengthened as a result of becoming aware of the research findings). Krotoski (2010, p.3) concurs that 'a breach in trust can destabilise the foundations upon which the online group rests', though he adds that 'social networking sites, like Facebook, may have a stronger sense of stability than social virtual worlds'.

A further consideration is that public groups may become exposed to advertising spam or other undesirable consequences such as trolling, when their profile is raised through research dissemination. As described above, after conducting our earlier research, we published the findings under an open licence and made them accessible from one author's own Facebook page and blog site so that group members could read what we had found. We are not aware of this having led to any undesirable consequences.

## **Conclusions**

Our research thus far, both that related to the public open scholar project and our more recent study of OU Facebook groups, adds to the existing literature in giving clear evidence that Facebook groups can be of great educational and institutional value. For example, Facebook groups can help in developing relationships between new students; by attracting potential students who are able to see real student experience of a particular course, allowing them to make better informed choices about what and where to study; and by providing an environment that is conducive to developing peer-support and self-educating learner communities for existing students.

It follows that the practice of researching such groups has value for learners, educators and host institutions alike. For example learners can find out about the optimum strategies for self-organised support groups within Facebook; educators can gain information about new ways of using social media within a pedagogical strategy; and institutions can gain insight into student motivations and preferences in order to improve the learner experience for existing students and attract new students.

However, our research also identifies various ethical complexities and challenges connected with researching within Facebook and while we have reached an overall, provisional conclusion that ethical regulations and restrictions should be proportional to the scale and purpose of the research and that the ethical dimension should not prevent socially and educationally valuable research taking place, the complexities involved in researching ethically in social media contexts demand broader attention and debate from scholars.

Zimmer (2010) details areas for further exploration, arguing that:

*“Future researchers must gain a better understanding of the contextual nature of privacy in these spheres...recognizing that just because personal information is made available in some fashion on a social network, does not mean it is fair game for capture and release to all ... Similarly, the notion of what constitutes ‘consent’ within the context of divulging personal information in social networking spaces must be further explored.”*

It is our hope that other academics will contribute to an exploration of the ethics of researching in Facebook, in the interests of a greater understanding of the potential of this powerful tool.

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## **STUDENT PERSPECTIVES ON THE USE OF THEIR DATA: BETWEEN INTRUSION, SURVEILLANCE AND CARE**

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### **Introduction**

The Open University (OU) is a large, open distance learning institution with more than 200,000 students. In common with many other higher education institutions (HEIs), the University is looking more closely at its use of learning analytics. Learning analytics has been defined as the collection and analysis of data generated during the learning process in order to improve the quality of learning and teaching (Siemens, Dawson, & Lynch, 2013). In the context of the Open University, learning analytics is the use of raw and analysed student data to, inter alia, proactively identify interventions which aim to support students in completing their study goals. Such interventions may be designed to support students as individuals as well as at a cohort level.

The use of a learning analytics approach to inform and provide direction to student support within the Open University is relatively new and, as such, existing policies relating and referring to potential uses of student data have required fresh scrutiny to ensure their continued relevance and completeness (Prinsloo & Slade, 2013). In response, The Open University made the decision to address a range of ethical issues relating to the University's approach to learning analytics via the implementation of new policy. In order to formulate a clear policy which reflected the University's mission and key principles, it was considered essential to consult with a wide range of stakeholders, including students.

### **Literature review**

Amidst the hype surrounding the potential of Big Data and more specifically the use of student data in learning analytics (Booth, 2012; Wagner & Ice, 2012), there are increasing concerns regarding the ethical implications of the harvesting, analysis, use and storage of student data (Prinsloo & Slade, 2013). Central to the general concerns regarding the protecting of privacy and informed consent, is the notion of "privacy self-management" which has its origins in the Fair Information Practice Principles (1973) which covers, amidst other issues, "individuals' rights to be notified of the collection and use of personal data; the right to prevent personal data from being used for new purposes without consent; the right to correct

or amend one's records, and the responsibilities of the holders of data to prevent its misuse" (Solove, 2013, p.1882).

Most of the current strategies regarding the harvesting, analysis, use and storage of student data focuses on issues surrounding informing students of the harvesting and use of their data, but as Solove (2013) and others indicate, most of these initiatives to inform individuals don't work because of the fact that

*"(1) people do not read privacy policies; (2) if people read them, they do not understand them; (3) if people read and understand them, they often lack enough background knowledge to make an informed choice; and (4) if people read them, understand them, and can make an informed choice, their choice might be skewed by various decision-making difficulties" (Solove, 2013, p.1888).*

Although many HEIs have adopted learning analytics to some extent, there is little formal evidence that students are aware or explicitly consulted on the broader uses of their data beyond research. Despite various claims regarding the success of learning analytics to improve student success and retention (e.g., Arnold, 2010; Clow 2013), Watters (2013) warns that "the claims about big data and education are incredibly bold, and as of yet, mostly unproven" (par. 17).

At Purdue University, students can access a video which explains how their data is used to produce predictions of their success and alerts them to potential progress problems using the Course Signals tool (Pistilli et al., 2012). The University of Maryland (UMBC) introduced a Check My Activity tool which gives students more control of their own data by allowing them to compare their online activity and grades to those of other students. UMBC has promoted awareness of this tool and its purpose. It plans to track which students engage with this tool (but provide an opt out facility for students who don't want their usage to be tracked) (Fritz, 2010).

More generally, there is broad discussion on the issue of transparency and the possibility – or even the desirability – of an opt out option, but little to suggest that HEIs consult directly with, or inform students explicitly regarding, the ways in which their data is used. In the light of the literature that indicates that we need to move "beyond privacy self-management", we should perhaps rethink issues such as consent and the unequal power-relationship between the institution and students, the advantages of opting in rather than opting out, addressing privacy's timing and focus and the codification of privacy norms and developing substantive rules for data collection (Solove, 2013).

## **Research design and methodology**

This study takes a directed content analysis approach. The “goal of a directed approach to content analysis is to validate or extend conceptually a theoretical framework or theory” (Hsieh & Shannon, 2005, p. 1281). Directed content analysis is therefore much more structured than conventional approaches to content analysis. Using a deductive, directed content analysis approach entails identifying key concepts of variables as initial coding categories, defined by theoretical frameworks and published research (Hsieh & Shannon, 2005).

The purpose of the study was to inform the development of new policy relating to how student data is used to shape student support by sharing an early draft and providing a number of structured questions for consideration. Data was collected over a period of 3 weeks in 2014 from the University Students’ Consultative Forum. The role of the forum is to enable students to consider and discuss matters affecting study at the OU and potential changes to University strategy and policy. It comprises 50 volunteered members who each participate for a minimum period of a year, appointed from the following categories:

- A core of representatives from the Open University Student Association, to include three central representatives, one from each of the four UK Nations, and two international students;
- One student from each of the curriculum-based consultation forums (17 in total) and one student from the University postgraduate research students consultative forum; and
- Student representatives on the various committees that make up the University governance structure.

Student representatives are asked to constructively contribute their personal views (as individual students rather than as formal representatives of other groups of students) to separate online discussions on matters affecting study and the student experience. The topic forums are limited to forum members for discussion purposes, but are open to all staff and students to read.

### ***Details of the discussion questions***

In preparation for the discussion, all forum members were given access to the draft policy which outlined the context and background to the University’s historical data collection, potential use of learning analytics, definitions of activity and data types which would be in or out of scope, and the set of eight overarching principles which would form the basis for the University’s approach to making more effective use of student data. Nine questions aimed at exploring both student awareness of the issues associated with a learning analytics approach and their reactions to those issues were posted online in a phased manner to the University Students Consultative Forum. One author had access to the forum as an invited moderator to

support the discussion and to provide clarification where needed. In the review of the posts, moderator posts were not considered.

Students were asked to explore issues around keeping their information up to date, transparency issues (why the University collects data and how it is used), to discuss their experiences of receiving student support messages during their studies, and to consider concerns regarding data collection and storage. The questions posted over the period are given below:

1. Do you regularly keep your StudentHome profile and other information such as study goals up to date? Is there anything the OU could do to make it easier to do this?
2. How often should the OU give you opportunities to check and update your data, and give consent to its use? What would be the most effective way of doing this?
3. Do you think the OU makes clear enough how and why it collects and analyses data? How do you think the OU should communicate its approach to students in the future?
4. Can you think of occasions when the OU has actively used data it has built up about you to offer you support tailored to your needs? Have these initiatives effectively used the information the OU holds about you?
5. Have you ever been offered support that you felt has not been based on relevant, up-to-date and accurate information the University holds about you?
6. Have you any other concerns about data collection, storage, updating and that you think the OU should address?
7. Do you think there is any information that the OU doesn't collect or use at present which it should do in the future?
8. Is there any information which the OU currently collects that you think is not relevant to supporting you as a learner?
9. Is there anything else you would like us to consider?

### ***Limitations of this study***

The forum is a recognised means of allowing students views to be reflected, and, as such, consults on matters relating to policy affecting students. It would be difficult to argue that the views of forum members can be accepted as representative of the whole of the OU student body. Their views can, at most, represent an initial basis for further research.

### **Analysis and Findings**

Over the 3 week period, there were over 300 posts. 35 forum members made at least one post and six students made 16 or more posts. The questions and resulting discussions fell into four broad categories: keeping student information up to date; transparency issues, discussion of student support experiences; and data collection, storage and analysis storage. A summary of the discussion is captured below.

### ***The need for accurate information and a shared responsibility***

The term ‘student profile’ caused some initial confusion. The discussion was intended to explore how students felt about updating information initially collected at the point of registration - mostly demographic data around ethnicity, disability, academic history etc, but including other information aimed to help provide relevant support, for example, study goals, reasons for study, etc. This information can occasionally become outdated, for example, if a student’s financial circumstances or geographic location change, but several students first interpreted this as referring to their visible forum profile (their photo or other picture and released contact details). Once clarified, it was agreed that the process of updating held demographic information was straightforward, although some felt that there needed to be clear, persuasive reasons given to keep the profile up to date. The purpose of collecting some data was not always understood. For example, study goals were felt to be liable to change, but if students were unaware of the use that is made of that information, there would be less of a driver to keep it up date.

*“I have not yet seen any persuasive argument for reviewing my profile on any basis, regular or otherwise.”*

Many students felt that the collection of this ‘core’ information was both irrelevant and intrusive, and resented being prompted – often several times – to update it and fill any gaps in University records.

*“I do not approve of the OU holding personal details on file about me other than those very specifically related to my studies. Some questions I view as impertinent and intrusive. Is the University hell-bent on gaining a reputation as an intrusive busy body?”*

This view was expressed by other students, suggesting that most were unaware that the Open University, like other HEIs, routinely collects a wide range of data for regulatory and reporting purposes.

Generally, there was no single consensus on any of the issues flagged here – rather than developing an understanding that students have a responsibility to ensure that their personal information is accurate and relevant, the discussion appeared to provoke further concerns and bring to the surface unease and irritation. In developing the idea of how often students might be prompted to review their personal information, many felt that students could do this at any time, others felt that an annual reminder to check (or at module registration) would be sufficient. The discussion began to unearth concerns about the implications of registration itself

*“and any registration such not depend on giving consent to be part of – choose your words here [tailored support; a research project; marketing data; alumni communications].”*

One contributor felt more comfortable with broader uses of his data, posting

*“it should be just an advisory indicating that it would be useful to update your profile both from the student’s own perspective and to aid the OU in its analytical exercises for the benefit of the university as an institution and to future students. Perhaps some sort of opt out clause for any data that some might have objections to, although I can’t imagine there would be anything that controversial that might produce flag waving student protests of epic proportions.”*

### **Transparency of purpose**

The issue of purpose perhaps raised the most emotive discussion over the period, generating more posts than any other topic. Students were clearly concerned that any data collection would be a new activity (*“didn’t know they used the information for stuff, so yes, I would appreciate knowing what it’s being used for”*), and that as a result, actions might be applied to them (*“some students have been appalled that an educational establishment has been collecting data that they didn’t expect. For example, monitoring their use of websites and how far they have progressed through a module.”*) or they might be prevented from making particular study choices. The general view was that more could be done to make clear what data is being collected, how it is being collected, where it is being collected from, the uses for which it being collected and who will have access.

Although contributors did recognise the positive intentions associated with a learning analytics approach, there were some murmurings of disquiet, perhaps best summarised by this student:

*“There’s a huge difference IMO between anonymised data to observe/monitor large scale trends and the “snooping” variety of data collection tracking the individual. I’m happy for any of my data to be used in the former; with the latter I would be uncomfortable about the prospect that it would be used to label and categorise students in an unhelpful or intrusive way”.*

There were a number of suggestions for communicating the approach to students in the future, for example

- stating exactly how information is used, with links to the detail;
- providing a basic summary of the key points on the student’s home page,
- communicating the approach at the point that a student is about to supply any data that is to be used;
- providing a fairly inclusive set of examples of what information is gathered and how it may be used.

### **Experiences of student support**

At this stage, contributors were more aware of the background to the discussion (the wish to make greater use of student data to tailor student support) and many had begun to voice concerns around how such an approach might lead to assumptions and generalisations. Against this background then it was a little surprising to have a largely consensus view that their experiences of student support to date did not appear to have been based on relevant (to them as individuals), up to date and accurate information. Indeed, there was a clear view that, as a result of generalisation, the volume of emails received from the University was excessive, with the result that potentially important (to them as individuals) messages could be overlooked, for example,

*“I get strange emails from time to time that are just not targeted at me (I tend to hit delete fast now). I concluded that the OU doesn’t make best use of data on what modules people have done/ what quals they already have.” and “The problem with an apparent blunderbuss approach is that it devalues the credibility of OU postings, so that any useful information is quite likely to end up under the delete key.” One student did spot the conflict here with other discussions relating to intrusiveness by posting: “Difficult for the University though to flag issues like this to students without holding data about what we do/how well we do/whether we use the forums/need advice...”*

This small post generated lots of useful discussion about how data could and perhaps should be used to provide a more personalised and relevant support service, with students suggesting that a learning analytics approach applied in conjunction with support delivered by a personal tutor might ameliorate the risks of labelling students incorrectly. Others felt that the involvement of tutors could effectively prejudice the tutor:student relationship by impacting on the tutor’s expectations of that student. Another set of students felt that if the analysis of their data resulted in a ‘false positive’ identification, the risk of mislabelling could be managed if the consequence were limited to the offer of a service (which could be declined) rather than the removal of study options.

### **Data collection, storage and analysis**

Views around the issues of data collection and storage were fairly non-contentious. Generally contributors expressed similar views which may be best summarised below:

- It is important to have a clear purpose for data collection and to communicate that purpose effectively ; to explain what data will/won’t be used for, and who can see it (e.g. on each student, in aggregate).
- A set of frequently asked questions developed for staff dealing with declaring personal information around diversity could usefully be replicated for students.
- There should be transparent policies about how long data can be held for and what the process is for handling requests for deletion of data.

- Data should only be shared on a ‘need to know basis’ – particularly where it is personal/sensitive.
- There should be strong and transparent governance in this area with a focus on ethics.
- Data handling protocols are important and should be enforced effectively.
- There should be periodic data audits.
- There should be an up-to-date data dictionary.
- It is important to address any concerns about the sharing of information with other organisations or the processing of information by other organisations.

The issue of analysis of that data caused more interesting discussion though with students flagging the differences between raw data and ‘derived information’. This theme cropped up in many of the separate discussions with concerns flagged about the reliability of the models used (“*people simply cannot draw the conclusions that they want to on the basis of a data pattern*”) and the ways in which model results might be employed (“*I have a concern that increased data-richness resulting in over-reliance on data and ‘computer says no’ responses. Catering for the individual is what’s needed. If data collection is used to help appropriate questions to be asked, fine - if it’s providing answers, very much not so.*”). Several students also flagged the need for staff involved in data analysis and in the delivery of intervention based on that analysis to be well-informed and appropriately trained.

## **Discussion**

The range of issues flagged in direct response to the questions posted has provided useful additional understanding of the student perspective. In addition, the discussions have occasionally touched on aspects of the application of learning analytics within higher education that were not explicitly sought. The two most prominent topics of debate centred around third party data sources and the issue of informed consent/opt out.

Students were quick to flag the dangers of data protection and privacy in relation to having their data passed on – e.g., where a third party undertakes a service on behalf of the University. These issues were assumed to be neatly dealt with by existing policy. However, there was also a view expressed that the University should not attempt to draw in information from third party sites for its *own* purposes. One post stated

*“I don’t object to somebody at the OU who I have seen fit to add to a Facebook group commenting. that’s why they have added to a group. But I don’t add The OU as an entity to a group. And I don’t expect it to go wandering about the web picking up snippets about me and feeding that in as data to be used in an analytical programme.”*

This student felt that such information could be easily misconstrued and would overstep the boundaries of acceptable permissions.

The most dominant issue raised across all of the questions posted though concerned the need for consideration of informed consent and/or opt out. This was flagged several times with students stating that

*“I think an opt-out option is essential for students who do not want to share data for whatever reason. No one should feel compelled to provide data if they don’t want to and they should be able to keep their reasons for this, which may be very personal, private.”*

and

*“Basically informed consent should be required. A right to refuse without compromising study ought to be built in.”*

Perhaps the view was expressed best by one post which observed the apparent correlation between certain study behaviours (the behaviour cited was lack of online engagement in the early stages of study) and success in a module. The author also noted the argument for a duty of care to advise people against making a potentially costly mistake by continuing on a course they might not complete. S/he concluded this by stating *“But it is ultimately their choice.”*

Interestingly, the Open University has approved the policy which will establish its position on the ethical use of learning analytics, but has not implemented the provision of an opt out clause. The background to this is complex reflecting the need to fully explore both the practical issues associated with enabling full (or partial) opt out, but most importantly to establish where the duty of care primarily lies. It is this latter issue that has led to a further consultation to establish what lies at the heart of supporting its students: to assume a moral responsibility for employing information which aims to provide more effective and relevant support for all students, or to recognize students as informed individuals with the right to choose not to receive targeted intervention and support based on their own information.

## **Conclusion**

The use of a forum to gather representative student views to feed into the development of policy covering a learning analytics approach to student support proved to be hugely useful. The range and complexity of many issues flagged has helped to inform and more clearly define the policy document and will feed into the ways in which communication of both the policy and the implementation of learning analytics will be rolled out across the Open University.

The direct involvement of the student voice in shaping a policy dealing with the ethics of learning analytics has offered a unique insight into the ways in which students regard their data – as a valuable entity to be carefully protected and even more carefully applied. In progressing the development of learning analytics in higher education, it is crucial to explicitly address the benefits and potential pitfalls of some an approach from the perspectives of all key stakeholders. This study has offered an opportunity to explore how students might react to

increasing uses of their personal and study data, and to facilitate a more considered and informed response.

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## **WHO GRADUATES FROM IRISH DISTANCE UNIVERSITY EDUCATION?**

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### **Abstract**

While there have been many studies on those who withdraw from distance education less is known about those who successfully complete degrees by distance education. Drawing on results from an online survey of recent distance graduates, this study, based in Dublin City University, addresses the gap in the research on this cohort of graduates. Findings indicate that graduates are primarily from lower socio economic backgrounds, a group largely under-represented in full-time university education. Significantly, a large percentage had never accessed any form of higher education before. More surprisingly, an equally large percentage had accessed full-time higher education previously, but at a lower level than the honours primary degree they obtained through distance learning. Implications regarding the role of distance education in both widening and deepening access to university education are discussed.

### **Introduction**

The concept of access is now understood 'to encompass not only entry to higher education, but also retention and successful completion' (HEA 2008 p.14). For this reason the focus of this paper is on graduates. The purpose of the research is to explore the role played by online distance education in improving access to Irish university education. The main questions explored in the paper are:

1. Are Irish online distance graduates from a group who are new to university education?
2. Are Irish online distance graduates from groups who are under-represented in university education?

The graduates in this study are not representative of all online distance graduates in Ireland. The intention of the study is not to generalise findings but rather to provide a unique insight and interpretation of a phenomenon (Merriman, 1988). To date, no study has explored the particular position of online distance university graduates in an Irish context.

### ***Participation in Irish university education***

Successful completion of higher education has long been held as significant in conferring job opportunity, security and status on participants (Thomas & Quinn, 2007). While participation in Irish campus based full-time higher education has grown steadily over recent years, research indicates that certain groups continue to be under-represented; namely those from lower socio-economic backgrounds and adults over 23 years of age (Harmon & Foubert, 2011).

Some theorists argue that increased participation in full-time higher education will inevitably result in an increase in social inclusion (Gorard, 2008). However inequalities can nevertheless be reproduced, in terms of course level, field of study and institutional status (Fleming & Finnegan, 2011). The abolition of Irish university tuition fees for undergraduates in 1996 facilitated middle class families to invest more heavily in second level education (Lynch, 2006). The net result of this is that young people from higher socio-economic groups perform better in the competition for university places than those from working class backgrounds (Denny, 2010). Participation at higher education by those from lower socio-economic backgrounds is therefore likely to be characterised by involvement in lower status courses (Fleming & Finnegan, 2011), for example at level 6 (certificate) or 7 (diploma/ordinary degree), where the required points for entry are lower.

Where the increase in higher education participation is for qualifications below degree level this can be problematic, as it is felt that the normal arguments relating to the benefits of higher education are 'usually based on more traditional undergraduate degree courses' (Gorard, 2008, p.427). Additionally, in the current Irish economy those with honours degree qualifications (level 8), or higher, find it easiest to obtain employment. The possibility of economic mobility from lower level courses is often slight as they tend to have a low value in the labour market.

### **The profile of distance education students**

Distance education research on student characteristics tends to focus primarily on psychological characteristics with a bias towards quantitative studies measuring the relationship between psychological variables (Qureshi et al., 2002; Coldwell et al., 2008; Carnoy et al., 2011). Research on demographic characteristics, such as social class, is somewhat neglected.

Where demographic research has been carried out, findings are more or less consistent; distance students in higher education are generally older than their full-time, on campus, counterparts, are more likely to be employed full-time and have family/financial commitments (Holmberg, 2005; Brown et al., 2012; Carnoy et al., 2012; Stöter et al., 2014). However, they are as a group getting younger (McLean, 2004; Guiney, 2014).

That distance students are not necessarily new to higher education is noted in a number of studies (Halsne & Gatta, 2002; Stöter et al., 2014). However, it is unclear whether the students

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in these studies are undergraduate or postgraduate, whether they had previously successfully completed an award, or what the level of that award was. Therefore, information which might be significant in relation to previous education attainment, and in a related sense to social class, remains hidden.

Although socio-economic background, as a demographic variable, is underexplored in the literature some studies do address it indirectly. Qureshi et al.'s (2002) Canadian study found that distance students were less motivated than full-time students. The annual income of the majority of students in both learning formats (i.e. on-campus and distance) was less than \$10,000. The distance students were more likely to be working full-time and married with dependents, while the full-time students (with the same income) were younger, unlikely to be working full-time or have dependents. It seems unsurprising that, in such circumstances, the distance students struggled with motivation. This study speaks silently of social class.

Other studies are more direct in their reference to socio-economic background. Holmberg (2005) comments that distance study contributes to upward social mobility. Brown et al. (2012) in their 'lived experience' study point out that distance students tend to be from a lower socio-economic background and are often Maori. Stöter et al's (2014) research from Germany identified socio-economic background as a differentiating factor between distance and on-campus students in tertiary education, with distance students more likely to have a lower socio-economic status. Bray et al. (2007) called for more empirical evidence regarding access to higher education, stating that there was 'little empirical evidence, positive or negative, of the ability of distance education to address these (i.e. access) problems' (p.894). They suggest more detailed comparisons on demographic backgrounds of distance and on-campus students for future research.

## **Methodology**

For this study a web-based survey was designed using a mix of closed and open questions, consisting of twenty-one questions in total. A 5-point Likert scale was employed for 8 questions (104 sub questions), with respondents choosing between two extremes of a continuum. The survey was piloted to ensure clarity of questions, to confirm the time it would take to complete and whether it was running accurately and consistent in all popular web browsers.

The survey was sent to two hundred and twenty seven (227) recent (2012 and 2013) distance graduates. Eighty two (82) graduates responded to the survey representing a thirty six per cent (36%) response rate. Descriptive analysis employing SPSS was carried out on the data. The survey data is supplemented, where available and appropriate, by data from archival records.

Access to DCU distance programmes is open, with no minimum entry requirements for those over 23 years of age (those under 23 must meet the minimum entry requirements of the university). The minimum timeframe for completion of bachelor degrees (level 8) is three or four years and the maximum timeframe is normally eight years. The minimum timeframe for

completion of master's degrees (level 9) is two years and the maximum timeframe is four years. As students take varying lengths of time to complete their degrees, graduate figures are not compared to registration figures in any specific year in this study.

The socio-economic classifications employed in this research are those used by the Irish Central Statistics Office (CSO). While there is no widely agreed definition of social class, occupation and education attainment remain the most widely used indicators.

## **Findings of the study on distance graduates**

### ***Socio economic background***

When determining the socio-economic background of full-time students we look at the social class and educational attainment of their parents. In order to contextualise this DCU study, parental social class (Table 1) and parental highest education attainment (Table 2) were examined.

The largest socio economic group of distance graduates (30%) came from a background in which their father was a Skilled Manual worker. Contrast this with new entrants to full-time university in 2011/12 where the background of the largest socio-economic group (18.9%) is Employer and Manager. The National Plan for Equity of Access to higher education (HEA, 2010, p.21), when examining participation in full-time higher education, identifies 'persistently low participation in higher education by students from low to middle income backgrounds'. Although the social class categories do not exclusively reflect bands of income, categories of 'Skilled Manual' and below tend to fall into the low to middle income bracket. For the distance graduates the highest participation is by those from low to middle income backgrounds. Fifty three per cent (53%) of distance graduates categorised their mother as a 'Homemaker', a category of unpaid work.

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Table 1: Social class

Social class	Respondent	Distance Grads. Respondent's father	Respondent's mother	Full-time university new entrants (2011/12) **
Employer/manager	10%	12%	4%	18.9%
Higher professional	44%	23%	6%	11.0%
Lower professional	32%	7%	17%	9.3%
Non-manual	9%	4%	5%	9.3%
Skilled manual	1%	30%	5%	11.9%
Semi-skilled manual	1%	8%	4%	5.5%
Unskilled manual	0%	4%	4%	2.4%
Own account worker	3%	3%	55%*	8.4%
Farmer	0%	9%	0%	7.6%
Agricultural worker	0%	0%	0%	0.8%
Unknown				15.0%

\*53% of respondents indicated that they had interpreted 'own account worker' as 'homemaker'.

\*\*Base number = 20,692, response rate = 87%. These figures are for new entrants to full-time Irish university, not graduates. Source HEA (2013) Key Facts and Figures 2011/12 p.86

### **Highest education attainment in full-time education**

Parental education is a significant factor when deciding to proceed to higher education (Flannery & O'Donoghue, 2009). The 2011 census tells us that young people with neither parent educated beyond primary school level are very unlikely to attend full time higher education (CSO, 2012 p.22). In comparison, the largest group (28%) of distance graduates were from backgrounds in which the full time education of their father had stopped at primary level or included no formal education (Table 2 refers). Additionally, recent survey data from the HEA states that just nineteen per cent (19%) of full-time higher education student's parent's highest qualification is low secondary level or below (Harmon & Foubert, 2011, p.21). For distance graduates, fifty-six per cent (56%) of their fathers and forty-six per cent (46%) of their mothers fell into this category.

With regard to the graduates themselves, it was possible to construct a picture of the previous highest educational attainment in full-time education of all level 8 graduates from archival records. (This exercise was only completed for level 8 graduates since those who undertake level 9 qualifications are normally required to hold a level 8 degree.) Thirty nine per cent (39%) of all level 8 online distance graduates had finished their full-time education at second level and had never previously accessed any form of higher education. For this group, online distance higher education is truly broadening access to Irish university education. Surprisingly, a further thirty nine per cent (39%) of the total number of level 8 graduates (NB not just respondents to the survey) had completed some form of full-time third level qualification (certificate or diploma/ordinary degree) prior to completing their level 8 distance honours degree. So, full time higher education is on their radar. 24% of that group met the normal university entry requirements on completion of their second level studies, so

were deemed capable of university study. Yet they do not go on to full-time university. They take up lower level courses instead. The HE funding mechanism, and resulting competition for university places, appears to be funnelling many students, capable of university study, into lower status full-time courses and subsequent delayed participation in university education.

Table 2: Highest attainment in full-time education

Highest full-time education attained	Distance Graduates*	Distance graduate's father		Distance graduate's mother	
	Level 8	Level 8 respondents	Level 9 respondents	Level 8 respondents	Level 9 respondents
Primary **	0%	18.5%	9.9%	12.3%	4.9%
Lower secondary	6%	18.5%	8.6%	21.0%	8.6%
Upper secondary	33%	7.4%	12.3%	14.8%	14.8%
Third level non-degree	39%	6.2%	2.5%	7.4%	3.7%
Third level degree or higher	6%	12.3%	3.7%	7.4%	4.9%
Not given	16%				
<b>Total</b>	<b>100%</b>	<b>62.9%</b>	<b>37.0%</b>	<b>62.9%</b>	<b>37.0%</b>

\*Figures are for all level 8 distance graduates; not just respondents to the survey.

\*\* Including no formal education

### **Gender, degree type and age**

The majority (64%) of the two hundred and twenty seven graduates were male. This differs somewhat from Irish and international research on part-time students which indicates that women are more likely to participate. Overall, however, the finding is consistent with international research confirming that males are more likely to participate in Information Technology related degrees (Coldwell et al., 2008; Carnoy et al., 2011). Female participation was more prevalent on the BA degree while male participation dominated the BSc and MSc programmes. Most graduates (68%) had completed a level 8 honours bachelor's degree, with the remaining graduates completing a level 9 postgraduate/masters' degree.

International research points to the fact that distance students are generally older than on-campus students. The DCU data is again consistent with international findings. The majority (79%) of graduates were in the 30-49 age groups, a group underrepresented in full-time higher education. That distance students are, as a group, getting younger could not be confirmed by the DCU data, as it has not been analysed for a sufficiently long period of time. (The gender, age and programme of study weighting were reflected in the response rate to the survey.)

## Conclusion

Despite increasing participation rates in full-time higher education, inequalities continue to be reproduced in terms of course level. This is important as the benefits of higher education normally relate to traditional degree programmes. Furthermore the possibility of economic mobility from low level courses is slight due to their diminished value in the labour market. In the early 21<sup>st</sup> century therefore, distance education continues to have an important social justice role to play by facilitating a broadening and deepening of access to university education.

Graduates in this study were primarily from groups who are under-represented in full-time university education; namely adults from lower socio-economic backgrounds. For some it was their first opportunity to access higher education. For others, who have already accessed full-time higher education at a lower level, it allowed them to upgrade and achieve an honours degree and the associated enhanced employment and life opportunities.

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## Who Graduates from Irish Distance University Education?

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## **LEARNING EFFECTIVENESS – A CASE STUDY ON CRITICAL THINKING AND COLLABORATION WITHIN HIGHER EDUCATION**

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### **Introduction**

The dominating theme of this paper is the contribution of ODL in teaching students within higher education to become critical thinkers and collaborators. An increasing demand on higher education today is to take on the challenge of 21<sup>st</sup> century skills. In Europe as well as worldwide they are described as essential skills in a knowledge-based society. Generally speaking you could say that developing 21<sup>st</sup> century skills aim at “learning to collaborate with others and connect through technology” ([www.atc21s.org](http://www.atc21s.org)). As a senior lecturer in educational sciences I teach and direct courses, which are offered to Erasmus students. A didactical challenge in this context is to meet with the students’ pre-understanding of the Swedish educational context. Generally the Erasmus students experience the Swedish educational context as ‘strange’ in a positive sense. They look forward to experience something ‘new’ and the overall driving force tends to be to learn ‘better’. This is in alignment with the Swedish Higher Education Act that stipulates that students are to develop the ability to “make independent and critical assessments, identify, formulate and solve problems autonomously” ([www.uhr.se](http://www.uhr.se)). Hence, teaching and learning turns into a question of both addressing the subject content and to critically inquire into it.

In my teaching I have used a blended course design (Glazer, 2012) for some years. This means that the students are put into a teaching context, which involves two mediums: a face-to-face classroom situation and a web-based learning management system called Blackboard. In a blended learning course the teacher aims at linking, or blending, “what happens in each medium so that face-to-face and online activities reinforce each other to create a single, unified, course” (Glazer, 2012, p.1). In short, teaching takes place both online and face-to-face. I have taught in both mediums and I have come to the conclusion that my students tend to think of face-to-face and online teaching as teaching media that oppose each other. A dominating pattern is that they prefer face-to-face teaching, and describe on-line teaching as “difficult”, or strange in the sense that they are not sure about what to do, or how to do it. This came as no surprise to me. It is well known that many students connect online teaching with different kinds of communication problems (Hara, 2010), while face-to-face teaching is assumed to involve getting more help and learning more (O’Neil & Horng Sai, 2014). In order

to empirically inquire into this tension between face-to-face and online teaching, I took on the researcher's gaze (Rodriguez, 2001).

As a researcher I systematically documented both the study result of the students, and the opinions they express in the course evaluation. One outcome of this documentation was that the students seemed to experience a complex and sometimes confusing learning situation. They looked forward to studying in an educational context, which was different from their home university. However, they assumed that the teaching would take place on campus, and as a reaction to the online context they were inclined to ask for teacher-directed face-to-face activities. Also, I found that the blended course design seemed to create a tension between the face-to-face teaching methods that the students described as “real teaching”, and the online activities, that they referred to as “writing texts and reading texts”. To take on the tension between (teaching) methods and (learning) content (Ramsden, 2003), I decided to re-design one part of the course. An overarching ambition was to find out more about the contribution of ODL in teaching students to become critical thinkers and collaborators.

My point of departure was to challenge the belief that teaching means transmitting knowledge in a face-to-face context; from teacher to student, and that students learn best when the teacher tells them what to do and how to do it. Paul Ramsden's (2003) claim that by shifting focus from teaching and learning as a question of (the best) technique to a matter of meaning and understanding, a teacher-centred conception of information as knowledge and teaching as transmission can be challenged. This was my source of inspiration for going fully online. My objective was twofold. I wanted to challenge the ideals of the face-to-face classroom. Also I wanted to use an online environment as a tool for directing the students' attention towards learning effectiveness as a question of meaning and understanding. In this process the skills critical thinking and collaboration were of special importance.

### **The case study context – the Course Teaching and Learning, a Comparative Perspective**

The course “Teaching and Learning – a Comparative Perspective” is set within a Swedish teacher education tradition and is mainly directed to international student teachers doing their Erasmus studies at Örebro University. Consequently, it is one of the courses the university offers as “international courses” in the ECTS-catalogue. The course is on an intermediate level and it is open to student teachers and teachers in pre-school, primary and secondary school.

The theme of the course is the relation between teaching and learning. An overall course objective is to deepen students' understanding of how different meanings of the relation between teaching and learning emerge from three different theoretical perspectives. These are an educational theoretical perspective, a democracy perspective and a literary (historical) perspective. What does it mean to learn? How can teaching promote learning? What factors facilitate learning? These questions point to the relation between teaching and learning, which is described, compared and discussed throughout the course. The role of fictional literature in

teaching, and in our ideas on learning, provides a recurrent aspect. It is the introductory part of the course, which inquires into education as a recurrent question within national and global schooling, which provides the empirical context in this paper.

The students who are part of the empirical material that this paper builds on, they come from Spain, Austria, Germany, Poland, Belgium, Luxemburg and Italy. Most of them are studying to become primary school teachers, and some have a more general interest in educational sciences. You could say that (primary) school and education in institutional settings dominate the students' (educational) interests. It is in this context, between a familiar course content on the relation between teaching and learning, and a foreign Swedish educational context, that students' openness and resistance to assignments that involve critical thinking and collaboration take shape.

### ***The aim and research question of the case study***

This paper deals with a case study, which is set in a higher education context and the quest for learning effectiveness. The empirical material of the case study is students' online conversations within the teaching unit: "Education as a recurrent question of national and global schooling". The overall aim of the paper is to inquire into the contribution of ODL as a means for developing the skills critical thinking and collaboration, and consequently, for learning effectiveness. The research question is: How does ODL contribute to the development of the skills critical thinking and collaboration?

### **A theoretical understanding of the skills critical thinking and collaboration – the concepts to question and community of practice**

A main assumption in this paper is that the ODL context challenges a traditional classroom context. As such it provides the driving force for students to develop the skills critical thinking and collaboration. This means for instance that in the online context the student's attention is directed towards the course content, the assignments and fellow students rather than to face-to-face meetings with the teacher. ODL as a tool for learning effectiveness implies in this case study the use of the online tools Discussion, wiki- and blog-writing provided by the learning management system Blackboard. All student assignments involve asking questions. Theoretically, this builds on an understanding of learning as acquiring a new experience. It is in the process of asking questions, and to question, that we put ourselves in a situation where we can see, or experience, the world in a new light. This means that we have the possibility to learn and, with Hans-Georg Gadamer, to become experienced. In other words, learning effectiveness means to ask questions to become experienced and to be open to new experiences (Gadamer, 1975/2004).

The theoretical understanding of the skills critical thinking and collaboration builds on a hermeneutic phenomenological perspective where the process of learning is understood as the interplay between the world as in the course content, and human beings as the students and teachers who are involved in the course (van Manen, 1991; 1997). Living in the world we

experience the world as something. What is familiar to us we tend to take for granted and refer as the world that ‘is’. However, now and then we find ourselves in strange situations where we do not know what to do or what is expected of us. Strangeness in the context of this paper presents a possibility to learn. Critical thinking is understood as the ability to question the familiar world that is the world we already know, while to collaborate involves openness to the experience of other people, and the courage to risk the world that ‘is’.

Developing the skills critical thinking and collaboration in the sense of asking questions and to question involves learning by participating in communities of practice (Lave & Wenger, 1991). A community of practice is: “a set of relations among persons, activity and world over time and in relation with other tangential and overlapping communities of practice” (Lave & Wenger, 1991, p.98). In the empirical context of this paper the communities of practice take shape in two ways. There are five study groups with five to six students in each. All groups have the same assignments to accomplish, i.e. writing a group-wiki and a blog. The assignments include a presentation of the result of the group work to other groups, as well as to give comments to each other. The comments are to be critically reflective, creative and to inspire further inquires into the course content. In short, the students both collaborate within their own study group, and by sharing their work, within and between groups. Thus, practising the skills critical thinking and collaboration within communities of practice by using the ODL tools is an integrative part of the course.

Before I go on to describe the methodological considerations of the case study I want to state that the hermeneutic phenomenological understanding of critical thinking and collaboration, as depicted above, applies to both the empirical context (the course “Teaching and Learning”, as it is shaped in the course syllabus and its ODL design) and the scientific aim and research questions of this paper.

### ***Methodological considerations***

The case study is set in an ODL context and the university course “Teaching and Learning, a Comparative Perspective”. The students are ‘international’ in the sense that they study in Sweden within the Erasmus programme ([www.esn.org](http://www.esn.org)). They live close to the university campus, and they have the possibility to meet face-to-face should they choose to do so. The course is announced as a “campus course”, and it is not until the students have registered that they get to know that the course is didactically organized in the learning management system Blackboard, and that the first part of the course is taught fully online. The teaching includes seminar discussions and student assignments. More concretely, the ODL context involves reading and writing texts online, for instance in the collaborative project of writing a group-wiki. The student is also asked to phrase questions and reflections to other students’ texts, for instance when reading and commenting student blogs. All group assignments involve an agreement on how to organize the work.

The empirical material of the case study consists of student online conversations. They are made up of student discussions on how to take on course assignments, as well as how to deal

with and understand the course content. The concepts to question and community of practice are used as tools of analysis for identifying the ODL contribution to the development of the skills critical thinking and collaboration.

## **Critical thinking and collaboration – ODL as questions, comparisons and openness**

This paper aims at inquiring into the contribution of ODL as a means for developing the skills critical thinking and collaboration learning, and consequently learning effectiveness. The empirical material of the case study shows that it is by (i) asking questions, (ii) comparing their experiences, and (iii) opening for ‘strangeness’ that the students develop the skills critical thinking and collaboration. A main conclusion is that the use of online teaching tools enhances learning effectiveness. When teacher-directed learning activities are put into play, the teaching content, rather than the teacher, provides the core of the student’s learning activities. The online teaching tools contribute to the development of the skills collaboration and critical thinking by framing student collaboration in communities of practice where they share experiences, write texts and solve problems together. In this process personal experiences are used as a frame of reference, and a starting-point for comparison and inquiries into the course content. Also, when ‘strangeness’ emerges, for instance when the students encounter new information or new concepts, the ODL context provides the common ground for negotiating different understandings.

### ***Educational systems and the Sami school – ODL contribution: to question to learn***

The first part of the course “Teaching and Learning, a Comparative Perspective” focuses on schooling and education in Sweden. As a first step, the students look for information about the Swedish education system on the Internet. They go on to write down questions and their reflections on what they have found out, and finally each student writes a text, which is published in the online group room. After having read and commented upon each other’s texts, the group is to decide on a theme for their group-wiki-writings. To develop the skills critical thinking and collaboration the students are asked to use questions as a tool for further inquires into the teaching content. Also they are asked to question the information they find. The ODL context provides a group discussion forum, and that is where the following online conversation between takes place. The conversation focus on the Sami school:

- I have never heard about the Sami school. But I think it is a school for special nation in Sweden. I’m looking forward to learn more about this school.
- While reading about Swedish education system I was also surprised that Sami have their own type of school. I was wondering if the curriculum for Sami pupils is much different then curriculum for Swedish student who attend normal compulsory school.

While looking for information about the Swedish educational system both students found information some about the Sami school. This was something they found ‘strange’. They had not heard about it before, and they are not sure about what it means. While sharing this

information they use words like wonder and surprise, and together they try to make sense of the information they found. You could say that they collaborate by reacting to the content of the information, and in this process, they use the skill critical thinking. A reasonable claim is that the ODL context directs the student's attention to the process of communication. The students both express themselves and 'listen' to each other, and the outcome of the online conversation is that they decide to find out more about the Sami school, and how it relates to the curriculum to finding for "normal compulsory school".

### ***Educational goals and national contexts – ODL contribution: to compare to learn***

In sharing information about the Swedish educational system, and together choosing the course of direction for further inquiries, the students use their national (home) context as a frame of reference. What is described as interesting or surprising tends to relate to something that the student sees as 'strange' in comparison to their home context. Sweden, and the Swedish educational system, takes shape in comparisons between familiar problems in the home country and strange rules and practices in Sweden. In the following excerpt the students are comparing the Swedish grading system to the grading system 'at home':

- I cannot avoid noticing more on those things that are supposed to be correct in Sweden, but in my country are not covered.
- I was also surprised when I read that all the pupils in Sweden have the same goals, and that there is no difference between them! That's one of the points that our country need to learn, every child should have the same opportunities.

Learning about the Swedish educational system includes facts about both the Swedish curricula and the grading system. The starting point for the student conversation above is the Swedish Education Act and the basic principle that everyone has the right to equal access to education and the right to education of an equal quality ([www.skolverket.se](http://www.skolverket.se)). One outcome of the comparison between different national educational contexts that the students are involve in is the question of what is 'correct' or 'right' when it comes to children's rights. This shows that the skills critical thinking and collaboration are developed in collective activities like sharing and comparing. You could say that to participate in the ODL context means (to learn to) collaborate. An important point here is that in the online group room the students have an equal opportunity to express their opinions, reactions and reflections. There is time and space for each student, and all group members can take part in the on-going conversation in their own pace.

### ***Educational assessment and grades – ODL contribution: to open to learn***

The expected outcome of all institutional education is learning. Higher education is no exception, and to measure the outcomes of education in national and international surveys like PISA and TIMSS is today a part of the everyday life within institutional education (Baker & Letendre, 2005). However, when students share information, experiences and opinions in the ODL context, the students direct attention to the meaning of the subject content. In the

excerpt below one student tells the other students that she has read that pupils in Sweden don't get grades until they are twelve years old. She can't believe that this is true:

- But are the knowledge requirements only starting at year 6? I mean the knowledge requirements for grades! Do children don't get grades in the years before???
- I will try to answer your question, maybe my answer is not correct at all, but our seminar mates can help us.

The conversation above takes place in the online group room, and the student who begins to answer the questions on grading in Sweden does so with reference to the other students in the group. The presence of the other students seems to be taken for granted, and what is said in the group room will be 'heard' by all the group members. "Our seminar mates can help us", the student says. Obviously, he assumes that what he is about to say will not qualify as the 'truth'. Also, the experience and knowledge of all the group members will contribute to everyone's understanding of the Swedish educational context. A reasonable conclusion here is that not knowing, not being sure or not understanding provides the point of departure for the process of learning, and that online teaching tools play an important part in this process. It is the student(s), and not the teacher, that asks the questions. To answer the questions involves critical thinking and in the ODL context collaboration provides the means for learning from each other.

## **Final remarks**

The aim of the case study presented in this paper is to inquire into the contribution of ODL as a means for developing the skills critical thinking and collaboration, and consequently, for learning effectiveness. The case study shows that the ODL context contributes to the development of the skills critical thinking and collaboration in three ways. It is by asking questions, by comparing and by being open that the students' learning becomes more effective, in the sense that they direct their attention to meaning and understanding. The case study also shows that the provided ODL context encourages students to share, to compare and to listen to each other's ideas and experiences. Throughout the online course module the students participate in an on-going conversation, which starts and ends by a student's comment on the course content. Collaboration, as well as critical thinking, builds on student activity, and these skills take shape in interaction between students, and between teacher and student(s).

This finding points to the importance of addressing the relation between teaching and learning. Paul Ramsden (2003) describes the relation between learning and teaching. Teaching, he claims, is a means of directing students' attention to learning as a process of understanding, and he states that "To teach is to make an assumption about what and how the student learns; therefore, to teach well implies learning about students' learning" (Ramsden, 2003, p.8). This statement directs attention to teachers within higher education as both teachers and learners. Hence, teaching means exploring students' experiences in order to be able to learn effectively i.e. teaching in a way that enhances learning in a desirable way. To

question, to compare and to be open develop the skills critical thinking and collaboration. These skills play an important part for learning effectiveness, and in doing so they also provide the tools for meaning and understanding. This finding suggests that it is by challenging the divide between (either) fully online education (or) face-to-face education that we as teachers and students can take on the contribution of ODL, and discuss it as a question of the relation between teaching and learning.

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## **SPEEDING-UP ADOPTION OF E-LEARNING INNOVATION IN EUROPE: MISSION POSSIBLE?**

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*“Innovation is unfeeling. It waits for no individual, and respects no organisation.  
It relentlessly flows ahead, washing those away who oppose it,  
dragging the remainder into its strong undertow.”  
Steve Wheeler<sup>1</sup>*

### **Introduction**

The need to equip European citizens with the so-called 21<sup>st</sup> century skills<sup>2</sup> is one of the central targets of the most recent EC documents in the field of education and training, and the role of ICT in acquiring these skills, both in terms of digital literacy and of other “literacies”, is recognized in all these policy communications (Bocconi et al., 2013; Brecko et al., 2014). The urgency of this can be perceived if we think that 15 million new jobs will be available in Europe by 2020 that require a total or partial new skills set, as estimated by the European Commissioner for Education and Culture in the March 2010 University-Business Forum. Furthermore, a number of recent studies<sup>3</sup> 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; and that some national ICT-for-learning policies, such as the Iniciativa Novas Oportunidades in Portugal<sup>4</sup>, 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 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 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 actors as possible – during the period 2002-2010 with the

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<sup>1</sup> <http://steve-wheeler.blogspot.com.br/2014/02/disruption.html>

<sup>2</sup> A complete list of definitions of the concept of 21st century skills is provided at [http://www.imls.gov/about/21st\\_century\\_skills\\_list.aspx](http://www.imls.gov/about/21st_century_skills_list.aspx)

<sup>3</sup> A review of recent studies in the field can be found in the MATEL report, at <http://ipts.jrc.ec.europa.eu/publications/pub.cfm?id=6360>

<sup>4</sup> See more at <http://www.novasoportunidades.gov.pt>

eLearning Action Plan – to the present phase, where the key policy objective is scalability. This clearly responds to a mismatch between the recognised potential of ICT to support innovation and change in education and the reality in most European countries. 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. Just think that 63% of nine year olds do not study at a highly digital equipped school and only 20 to 25% of students are taught by digital confident and supportive teachers (European Commission 2013).

As suggested by a recent IPTS Report, a “policy recipe” for replication and multiplication of successful implementation does not exist, and ‘one-size-fits-all’ and ‘one-off’ models of innovation do not work in education. On the contrary, policies should encourage multiple and differentiated pathways to scale up innovation in ‘organic’ ways (Kampylis et al., 2013). Scaling up should be considered as a contextualized and organic process that allows for continuous change and adaptations in order to address on one side the continuously shifting requirements of society and on the other the fast technological developments of our times. Along these lines, the policy priority of the European Commission in terms of learning innovation is very 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, 2013, p.4). 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. In line with this policy objective, the European Commission is supporting a number of projects which have the aim of fostering scalability of ICT-for learning (innovative) practices in Europe.

## **How to speed-up innovation adoption the HoTEL Innovation Support Model<sup>5</sup>**

The first step taken by HoTEL to design the Innovation Support model was to analyse the four main genesis models that exist in the field of Technology Enhanced Learning. First, a *technology and industry-led model*, in which the availability of a new technology, normally not specifically designed for learning, finds a number of educational or informal learning applications that may lead to large adoption out of massive industrial and commercial investment. The case of tablets use within classrooms but even more importantly in informal learning corresponds to this model. Second, a *research-led model*, in which learning theories search and find application in experimental learning settings that are created and monitored to check learning effectiveness, usability and other key features of both generic and learning-specific new technologic applications. Third, a *practice-led model*, spontaneous bottom up innovation emerging from individuals or communities of teachers and learners that find

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<sup>5</sup> This paragraph reports on the findings of the HoTEL project work, and is the results of a collaborative effort by the HoTEL project partners. Special thanks goes to Claudio Dondi and Stefania Aceto from the MENON Network.

## Speeding-up Adoption of e-Learning Innovation in Europe: Mission Possible?

Fabio Nascimbeni, Vana Kamtsiou

original ways of using technology to materialise new ideas about learning and teaching and are able to demonstrate their effectiveness in new contexts of use. Fourth, *the policy-led innovation model*, materialised by the many national programmes launched since the 80s to diffuse ICT and its use in classrooms. In the HoTEL view, these policies gave support to one or the other of the existing three models, or a combination of those, without really establishing a different genesis model. Policies may become very relevant, on the contrary, in the subsequent steps of innovation life cycles, and notably adoption, scaling up and institutional exploitation.

Each of these genesis models of TEL innovation carries with it some strengths and some weaknesses. An integration of approaches is very desirable and an important part of the Innovation Support Model that HoTEL is trying to build, with the aim of integrating the experience and findings from all these different TEL innovation communities. The figure below illustrates further this integration concept via the three HoTEL Learning Exploratorium Labs.

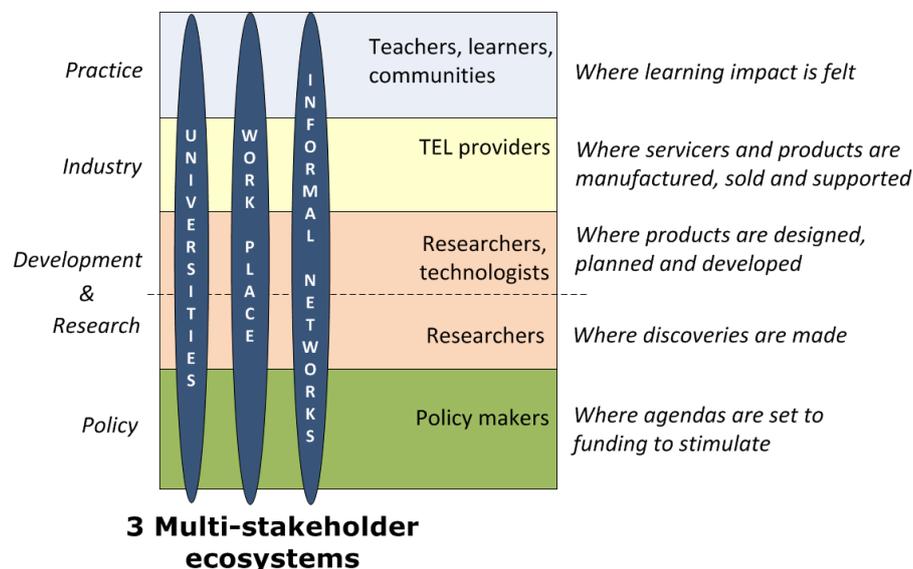


Figure 1. Integration at the level of sector-stakeholders

In view of the HoTEL project<sup>6</sup>, three main problems affect and delay the adoption of innovation processes in ICT for learning, whatever genesis model we look at. First, innovative practices in the use of technologies for learning are often not sufficiently considered by research whereas bottom-up innovation is playing an increasingly important role in the field. Second, there is a need to verify the impact of existing learning theories on ICT for learning practices to determine whether this has led/is leading to innovation. Third, the lack of an holistic approach in the field puts at risk the effectiveness and mainstreaming of new ways of using ICT for learning purposes: too often the time span between the identification of technologies that have a potential for learning, the theoretical analysis of pedagogical implications, the piloting of such technologies and their adoption (first at small scale and then

<sup>6</sup> All information about the HoTEL project is at <http://www.hotel-project.eu>

mainstreamed) is so long that the technology itself becomes out-dated compared to the changing environment and learning needs.

Based on these critical assumptions, the HoTEL project has been working in the last two years to contribute to more effective, holistic and faster innovation cycles in European Technology-Enhanced Learning (TEL), by proposing an *Innovation Support Model* able to increase quality at the level of the innovation cycle itself and of the different phases foreseen, that can be replicated in the future. At the very moment, the project is testing the support model in the frame of three “innovation laboratories”, and will produce its final results at the end of 2014.

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 road to success for a TEL innovation depends, to a large extent, on the possibility to be understood and supported by some categories of stakeholders that are not always the same (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 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/support the innovation development. Furthermore, what appears a big success in a certain context may not work at all 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.

Within the scope of the HoTEL project, innovation support has been defined as a support in 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; and where innovation support 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. From this perspective, innovation support models are essentially relational models, linking innovators to their context through a structured set of interactions that, in the case of HoTEL, take place within and around the *Exploratorium Labs*. The Learning Exploratorium Labs represents a key concept of the HoTEL project: they are innovation-friendly learning environments, one in higher education, one in corporate setting, one within an international professional network focused on eLearning quality, which will test and support selected TEL innovations in real-settings. While the Labs provide direct interventions to the selected innovation cases via use of innovation experts from all the above four sectors, HoTEL has also scheduled other specific activities to support this integration: mapping of R&D discoveries and future areas of research, identification of technology development trends coming from the industry sector, research on new learning paradigms

and on how they relate to known learning theories, etc. As shown in Figure 1, these different innovation sectors are supporting the Labs with different types of intelligence, such as competitive, market, technology, research and policy intelligences that help the stakeholders to both make informed decisions when assessing their innovations as well as to invite members of these sectors to join the labs.

### **Need for a systemic approach**

The field of Technology Enhanced Learning (TEL) is considered to be a diverse and multi-level domain, involving many types of players, working in different cultures and operational contexts, under varying jurisdictions, with differing and sometimes opposite approaches to pedagogy and the task of education. Looking more deeply, the TEL domain is not only varied, but the adoption of TEL in general, and “products” in particular, is also complex, with many technical and organisational interdependencies. Multiple root technologies such as content delivery and assessment need to be integrated with other technologies that are found outside TEL, such as those related to Big Data, Artificial Intelligence and internet of things. These kind of technological innovations which are produced on the interface of several technologies are in turn giving birth to new pedagogical innovations, and new learning and educational practices, such as seamless learning, microlearning, rhizomatic learning, etc. In addition, TEL innovations have a nature of expansion and change, which transforms both the learning practices and the communities themselves that adopt the innovation (Paavola et al., 2004). For example, in the school sector, Engestrom (Engestrom et al., 2002) tells us that there are several factors that make innovation in schools very difficult. These factors include social, spatial, and temporal structures embedded in classrooms, teachers’ culture of working in isolation, and political top-down governance. Thus, most TEL innovations are not linear, single rooted or independent, but rather systemic, involving several converging and or competing technologies, complex interactions by many players, who have to collaborate in order to align their contributions and develop holistic solutions, rather than simply the introduction of new standalone products. Hence, these types of systemic innovations have “a nature of integrality” (Kaivo-oja, 2011), and at the same time a nature of multi-diversity, since the applications envisioned usually require for different development pathways per involved technology. Different providers of systems, content and services are often mutually dependent and a degree of coherence between them is necessary to transfer TEL innovations to the mainstream. Further, many other types of stakeholders have to come to agreement about what is wanted and how it should be provided. When organizations are looking to introduce and manage TEL innovations, they need to take into account the whole eco-system in which they are operating. The focus is on desirable systemic change by which we mean changes in business (and learning organizations), learning processes and practices, as well as technological (software, and tools and infrastructure) and social (e.g. role of learning in developing European citizens, their employability, and personal fulfilment). At the same time TEL innovations can also be regional, national and at European levels.

For systemic innovations to be successful the “functional logic of the whole product/service delivery and supply chains (suppliers, manufactures, distributors, value-added resellers, installers and consumers) may change because of the new innovations” (Kaivo-oja, 2011). In case of TEL, educators, software developers, brokers, policy makers may also have to be aligned, co-innovate and make changes for the successful adoption of innovations. Most common types of incremental innovations are (i) technological innovation, (ii) business innovation and (iii) social innovation. In systemic innovations, these three types are systemically interconnected, so that systemic changes in one of these three innovation types can introduce changes or innovations in the other two innovation types as well (Kaivo-oja, 2011).

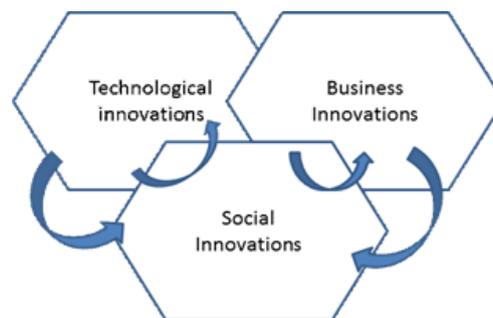


Figure 2. Synergy field of different forms of innovations  
(source: Jari Kaivo, 2011, Figure 1.a Systemic synergy of technological innovation, business innovation and social innovation, p.7)

The challenge for innovation-supporters is to understand which element drives the systemic innovation (key innovation element) and then organize the other elements inside its strategic framework logic. For example, if (1) technological aspect of innovation is the key element of the innovation the other 2 elements of innovation are subsystems of larger systemic innovation (Kaivo-oja, 2011). In our case, we have added one additional innovation type “learning practice innovations” specific to TEL innovations.

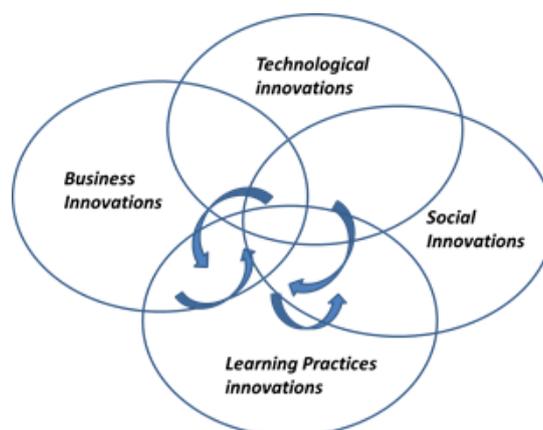


Figure 3. Synergy field of different forms of TEL innovations

This was so to take also into account the complexity of TEL innovations, which need to be fitted within or to innovate/disrupt current learning practices and pedagogies. Consider for example how innovations or “value propositions” from software designers and platform

developers influence and impact the individual contexts of teachers (teaching practices at schools, training needed to adopt the new systems, professional development) or those contexts of schools administrators and IT managers, where they need to make informed decisions on access, affordability, quality, and adaptability to existing organizational processes, or a ministry of education, who may have a say in how the innovation fits with the school curricula, place and time of adoption. TEL innovators need not only to be informed of the current and emerging learning practices supported by TEL, but also to understand the current analytical frameworks with which to make sense of this complexity and to use as checklists against proposed innovations or indeed learning paradigms to consider their nature. Such analysis of the related learning practices and the analytical pedagogical frameworks is intended to lead to improvement in design or in the change-management of its adoption. In other cases they may help identify the assumptions made of existing practices that can be combined with the innovation to ensure its viability.

### **Conclusion: the importance of holistic and context-sensitive strategies to speed-up innovation adoption in TEL**

In a nutshell, the HOTEL Innovation Support Model is putting forward six “structuring assumptions” that should be taken into account when we want to support mainstreaming and scalability and to speed-up the adoption of TEL innovations:

1. Recognition of the diversity of innovation paths, along with innovation channels, start points, contexts, expected outcomes, success criteria and, in general, every single step and factor of the support model and the setting.
2. Recognition of an existent difficulty on measuring ‘success’ within a TEL innovation setting. How is success defined? Do we use pedagogical, technological, socio-economic, business-economic, or other criteria to determine what can be considered as being a success?
3. Embedded flexibility and adaptability of the support model in order to match different stages of innovation development and different contexts and innovation paths. The support model must take the various key factors from every context, stakeholder, and user, to integrate them into the innovation, so that a unique experience is produced. This unique experience feeds every actor of the setting (i.e. Higher Education, Workplace learning, and Informal Learning in Networks), included the model and the innovation themselves, making a full iterative cycle.
4. The core concept in the support model is that of a “multi-stakeholder ecosystem” (with different stakeholder representatives according to the nature of the innovation proposed) that analyses and eventually tests 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 (i) Practical, on the ground, with real users and in a real context-setting or (ii) Theoretical, with a deep-thinking test bench by experts and qualified users.

5. Context-sensitivity of the analysis and support action proposed, in order to distinguish transferable from non-transferable success factors, according to a well-defined set of criteria
6. If implemented, the innovation must take from the support model all the required input for a fresh start, making a two-step implementation phase. With this approach, the implementation makes use of all the lessons learnt and best practices from the theoretical phase with the Lab, but it will not be restricted by them when it comes to a market-context, which might take into account an additional set of success criteria and specific implementation conditions.

In other words, HoTEL calls for a multistakeholder and context-sensitive approach to TEL support, where it is fundamental to look at innovations by keeping in mind all the specific challenges that they have been facing, are facing and will be facing in the next steps of their development. For example, since TEL innovations are transforming the practices and the communities that adopt them, we cannot consider them as standalone products or services, without keeping into account that they interplay with their context, both influencing and being influenced by it. What should be done – in the HoTEL view – is instead to consider innovations as “system-activities” which aim at a specific innovation “objects” and which lead to a set of desired “outcomes” for the involved communities. This will enable us to understand the dynamic nature of these innovations and their relationship to the dynamics of knowledge creation within the communities involved (Engestrom et al., 2002). The HoTEL support innovation model takes this into account by providing some formative interventions in the form of its Exploratorium Labs, a historical analysis of TEL innovation milestones and trends, as well as the evolution of the learning practices. Thus, providing the opportunity for TEL innovators to assess and re-align their innovations within real contexts and setting.

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**Speeding-up Adoption of e-Learning Innovation in Europe: Mission Possible?**  
*Fabio Nascimbeni, Vana Kamtsiou*

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## **LIFE-WORLD FACTORS OF DISTANCE EDUCATION STUDENTS AND THEIR INFLUENCE ON LEARNING ACHIEVEMENT**

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### **Introduction**

Every human being has an individual demand for specific (further) development of competence, depending on his or her personal life phase. On the grounds of its history, development, experiences, and the structure of its modularized study programmes, the FernUniversität in Hagen as a lifelong learning university in the German-speaking world helps to satisfy this demand (Vogt, 2012). The seamless learning approach supports flexibility of “distance” studies in terms of place, time and content (see for example Krey et al., 2014), which attracts above all non-traditional students (Alheit et al., 2008) who have completed a first degree and are now working, in the age group 25 to 38 (59%) and 39 to over 60 (FernUniversität in Hagen, 2014).

Analyses of the studies or learning achievements of distance education students take into account in particular the motivation for studying (Kaiser, 1997; Baacke, 1978), the particular socio-economic situation of female distance education students (Prümmer, 1997), or study materials (Richardson et al., 1999).

This paper focuses on the influence of life-world factors on the learning achievement of students, looking at the example of the Bachelor degree course in Education Science at FernUniversität in Hagen (life-world study).

The paper starts by considering avenues of access to the term life-world based on theory (2) and describes the status of research (3). It then describes the methodology of the life-world study (4). The life-worlds of the students and the concept of learning achievement are then presented in summary form with initial, preliminary results (5). The paper ends with a summarising conclusion (6).

### **Avenues of access to life-worlds based on theory**

The term life-world goes back to Jürgen Habermas (1987) and Alfred Schütz (1982). According to Habermas, the life-world is the context-creating background. Mollenhauer (1974, p.35) constitutes the life-world of the individual by linking the individual’s biography

with others. The capacity for cognition and action is generated from the life-world circumstances. According to Jäger and Matys (2008), access to the life-world is opened by participating in social interactions. It is the everyday location of social action. Life-worlds are structured in culturally pre-formed sense worlds with historically shaped perceptions and experiences (ibid., p. 32). Human beings gain experiences, whether processed or unprocessed, comprehended or un-comprehended, reflected or un-reflected, by acting and pursuing a purpose (Ortmann, 1977, p.87). Thus the life-world can be designated as a “total sum of all circumstances” (Schütz, 1982, p.181) that correspond to the autobiographical situation.

Comprehensive consideration of the life-world with all the socialising conditions includes the individual personality in its distinctiveness (Hurrelmann, 2002, p.16) and uniqueness, as well as the processes of social reality.

Bourdieu (1974) identifies class-specific mechanisms at this point. Growing up within a specific milieu in certain living conditions allows a certain habitus to develop automatically and largely unconsciously. Daily action in a social environment influences thinking processes and interactions. For Bourdieu, individuality (the self) and collectiveness (the environment) are accordingly not opposites. The collective in the form of culture and education is integrated into and present in each individual project (ibid., p.132).

In order to register all the life-world conditions of distance education students in their entirety, their private (socio-economic) conditions, their professional situation and their everyday student life must be determined. All environmental factors are determined by social circumstances and leave significant traces.

### ***Studies of the student life-world***

Perusal of the studies dealing with the life-world of (distance) students is a manageable task.

Alheit et al. (2008) are among those who have examined the study perspective of non-traditional students, to whom distance education students also belong. The differences by comparison with traditional students include concrete factors such as the following.

- The majority of qualifications for matriculation are acquired by alternative means.
- Studies are not commenced directly after obtaining the upper secondary school leaving certificate (Abitur).
- The students are older.
- The students have completed occupational or professional training and are in the work process.
- Many students study part-time parallel with their work.
- Students have family and children.

The authors ascertain that the special socio-biographical backgrounds of this study group have so far only been examined rudimentarily (Alheit et al., 2008, p.579).

## **Life-World Factors of Distance Education Students and their Influence on Learning Achievement**

*Karin Krey et al.*

The first life-world analysis of students at FernUniversität in Hagen was carried out by Baacke (1978). The study focuses on examining the motivation to study and the learning situation of the distance education students. Using qualitative-narrative interviews, the author asks what influence the everyday world of the distance education students has on their study situation. These data serve to analyse what individual biographies and life-worlds lead to what study behaviour. It becomes evident that starting a distance study course by no means alters the students' entire lives, but it does change certain elements, and difficulties increase.

The question about the motivation for starting a (distance) study course after completing professional or vocational training or a first degree course is answered by Kaiser (1997). The authors only asked older students and two primary motives for studying emerge.

On the one hand persons particularly interested in education, for whom learning assumes a high value, begin to study (*ibid.*, p.91). Here there is a need to catch up on academic (further) education. Reasons for this are the loss of missing out on education opportunities in the course of these students' lives. On the other hand individuals study because they are searching for a meaningful activity as they become older, wanting to spend free time they acquire usefully (*ibid.*, p.108). The decision to start a degree course is, however, by no means seen as a leisure activity, but instead definitely as a commitment to be taken seriously, in which work and time are invested in order to experience the studies as a meaningful activity. Kaiser sees the life-world reference of the students as an essential condition for the effectiveness of education (*ibid.*, p.252). For this reason, especially among older students, the arts and social science disciplines are the preferred subjects because these are characterised by proximity to life.

At FernUniversität in Hagen, Prümmer (1997) conducted a study of women in distance studies. This concentrates on female distance education students from the working class and examines the permeability of the social structure and opportunities of social advancement (*ibid.*, p. 11). The distance study course is used as a means to continue the process of social advancement already begun (*ibid.*, p.210). Statements concerning the education and employment biography and the students' personal situation display very high educational backgrounds (*ibid.*, p.195), but do not supply any information about the competencies possessed by the distance education students.

To summarise, it is possible to agree with Ortmann, who believes that the concepts of the universities generally separate academic knowledge from the knowledge acquired in everyday or occupational socialisation processes (Ortmann, 1977). Singular experience and hence subjective empirical knowledge remain concealed in everyday knowledge which is not scientifically/academically authorised. Only the examination rules that are applicable for all together serve as an orientation aid. Ultimately, competition mechanisms and mutual uncertainties become manifest and impede learning together in solidarity (Ortmann, 1977, p.56).

Teaching at FernUniversität in Hagen does not pursue a conventional knowledge transfer perspective from the teacher to the learner, but instead is oriented in the adult education discourse to the principle of acquisition by individual input. According to Kade and Seitter (1999, p.34), this acquisition process is shaped by life-worlds and steered by the biographical second programming. That is why it is queried whether the study material designed at traditional universities must display a similar validity as that for students at distance universities (Richardson et al., 1999), or whether it must instead be characterised by specific differences. The private and occupational context of the students is channelled into the (distance) study course and integrates knowledge already acquired consciously or sub-consciously. The life-world influences the preference for certain study contents, the selection of subjects, and presumably also the form of learning and the academic achievement of the study course.

### **Methodology**

Against this background, the Life-World Study (commencement March 2014) examines the question:

*What influence do life-world factors have on the learning achievement of students in the Bachelor course at FernUniversität in Hagen?*

The task of the study is to record the life-world connexion explicitly in order to obtain a specific insight into the conditions and challenges as well as already existing potentials of the students. Due to the high number of students in working life who are starting their first university course, it is suspected that the students possess a pool of knowledge and educational background. Completion of vocational or professional training provides orientation and capacities for action (Georg, 2008, p.90). It packages personal capabilities and standardises certain behaviour patterns (ibid., p.91). However, not only people in the work process possess institutionalised culture capital that integrates capabilities and competencies, but also university graduates.

It is to be assumed that we have an extremely heterogeneous field of students with specific skills, capabilities and concrete experiences (practice and theory). It is interesting to know to what extent these already existing competencies from the different life-worlds co-determine learning achievement in the study course. The life-world factors are sub-divided into three categories – private, professional and student life-worlds. Students of Education Science are questioned about these three life-worlds using narrative interviews (Küsters, 2006)<sup>1</sup>.

In the private context, the family situation with all its challenges and duties is of interest. As regards the professional background, details of previous education, vocational training or (special) college training, specific capabilities and requirements are surveyed. The

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<sup>1</sup> So far 15 explorative interviews with students of the Bachelor degree course Educational Science at FernUniversität in Hagen have been conducted within the framework of face-to-face events of Module 2A "Empirical Education Research – Qualitative Methods" by Karin Krey (in the period May-June 2014).

competencies possessed by the students and the nature and scope of their educational background are significant. All the above factors are set against the student life-world. Here it is interesting to know how the students manage to cope with their studies, how they organise matters, what learning materials and what forms of learning are helpful or less helpful.

The narrative interview method refrains from theory-based and empirical preliminary assumptions in order to be able to slip into the life-worlds of the students quite openly without any prejudices (Ashworth & Lucas, 1998). The MAXQDA software serves to evaluate the contents of the interviews (Mayring, 2008). The inductive category formation in the course of summarising the quality substantive analysis is used (ibid., p.74) in order to record a naturalist and object-oriented image of the material.

After studying and analysing the first interviews (June-July 2014), a preliminary system of categories is developing. The code tree runs along the interview structure addressing private, professional and student life-worlds. The private life-world takes up the family structure and challenges, as well as existing competencies. The working life-world addresses the corresponding educational and training background, the career to date and the competencies acquired at work. The student life-world addresses the motivation for studying Education Science and the degree project. The study is compiling data on the progress of studies as well as the use of preferred teaching materials and forms and the wish for further learning options. A further category is examining the different facets of learning achievement and hence where the focus of the student's own life-world lies.

As a preliminary result, a few summarising statements on the **life-world** of distance education students and on the category of **learning achievement** are set out below.

## **Results**

The **life-world** of the students is chiefly determined by private factors. Family situations take first place. The study achievements of the students are largely dependent on the private component in the life-world. The challenges of family life or partnership relations influence the organisation, planning and rhythms of the student routine. "Many things revolve around organisation, around the family, around the family that determines zones of freedom" (IP3<sup>2</sup>). The work process takes second place. On the one hand many students channel their existing competencies into their studies. "[I went] to the Oxford Academy of English and gained a few diplomas there" (IP2<sup>3</sup>). On the other hand students deal intensively with those subject areas of their course that are particularly interesting to them or that can subsequently be used

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<sup>2</sup> Legend: IP=Interview person.

**IP3:** Male, age 30-40, living with partner, two children, trained as a clerk in the publishing industry, started a degree course in Journalism and Communications but broke it off, works in advertising on a freelance basis, as a producer in the film industry, freelance director and concept developer, in his 6<sup>th</sup> semester of the B.A. in Education Science course.

<sup>3</sup> **IP2:** Female, age 60-70, living alone, no children, abandoned university course in English and Romance Studies, qualified Marketing Expert, lecturer on advertising design, client consultant in an advertising agency, coach for Statistics, 5<sup>th</sup> semester of the B.A. in Education Science course.

profitably in their work. “[I] looked at the module, [...], what is available, and then it is possible [...] to select a module oriented to my work” (IP1<sup>4</sup>). Students have generally already been predisposed by existing practical know-how so that certain modules can be used to mainstream theory aspects.

The internal platform Moodle is available to students for processing the study contents of their course. The students appreciate the varied information and good contributions that Moodle provides for addressing this content. Prümmer and Rossie (1988) show that male students find handling computer-supported learning easier than female students. This cannot (yet) be confirmed at the present stage of analysis by the life-world study undertaken here. The platform Moodle is only used when a number of students work at the same speed and make progress. “Moodle is great if you can keep up” (IP5<sup>5</sup>). However, as of the moment when the students are unable to keep up with the working speed and information diversity of the others, they withdraw into anonymous learning and studying. “I am so slow. And I learn directly in a quite different way” (IP5).

The distance education students interviewed define the term **learning achievement** via a number of sub-categories<sup>6</sup>.

The increase in knowledge ranks high. The students are not only interested in acquiring knowledge quantitatively, but also in particular in understanding what they have learned. Understanding knowledge means acquiring knowledge sustainably. Only the knowledge that they have internalised remains in their memory and has a long-term effect. “Simply learning by heart and then reproducing it quickly or spitting it out and off you go – I personally gain nothing from this” (IP3). Learning achievement means drawing benefit from what has been learned, for example by comprehending scientific theories, making connections between them, and being able to demarcate them from each other in terms of theory.

The subjective preferences of the students are significant. If the interest of the students is aroused with a certain theme, then they obtain additional information by researching teaching materials and reading. The subject is then tackled in depth and explored, which has a positive influence on the learning achievement. “If I notice that a topic interests me, then I would like to understand it somehow and I notice unconsciously myself that I do not stick to the course materials but instead read a lot of external literature on the topic that I seek out myself. If I then have the feeling that I understand what the authors are writing, then that is [...] the learning achievement for me” (IP3).

Learning achievement does not necessarily correlate with good examination grades in the form of scores. Having passed is sufficient for many students. The distance education students

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<sup>4</sup> **IP1**: Female, age 20-30, living with partner, no children, trained as technical draughtswoman, works as desk officer (order processing), 6<sup>th</sup> semester of the B.A. in Education Science course.

<sup>5</sup> **IP5**: Female, age 20-30, single parent, one child, abandoned university course in Economics, trained as European communications assistant and advertising clerk, works as freelancer in marketing, student research assistant, speaks five languages, 6<sup>th</sup> semester of the B.A. in Education Science course.

<sup>6</sup> The various sub-categories are shown *in italics*.

interviewed do not allow themselves to be pressurised for a good mark. “If I get a good mark, then of course I am pleased, but if I [...] only just pass, then that’s OK too (IP1)”. A good mark is only important for personal learning achievement in individual cases. “A super learning achievement [would be] a good mark” (IP4<sup>7</sup>).

At this point *recognition* enters into play. Learning achievement in a study course is on the one hand a personal success for distance education students. “I simply want a [recognised] qualification. I find this [...] appropriate” (IP3). In some cases students had unfavourable learning conditions and correspondingly few success experiences in their former school life. Success in a distance study course therefore suits them with pride and gives them a portion of self-confidence. “In my schooldays [...] I never had to repeat a class. But I wasn’t really on top of things. [...] Now [I have] results that suit me” (IP2). On the other hand, learning achievement in a degree course also involves recognition by others. The students harvest recognition from their families and from fellow students.

Most distance education students are integrated in *study groups* of approx. two to eight persons. Study groups are both static and dynamic units. While (just) a few members study together right through to the end of their course, other group members change constantly. This is because each learner is a specific learning type with his or her own learning and working speed and is integrated in different family or professional contexts. All the interviewees to date prefer joint learning in face-to-face exchange. Kirkup and Prümmer (1990) identify this as a typically female behaviour pattern. Groups seek and find and then discuss a certain topic together. Each individual has already processed this theme alone, and exchanges only take place after this. The joint exploration is fruitful for all participants. It increases the feeling of self-esteem because it involves one’s own positive contribution and is useful for all. “[For me this means] satisfaction and to a certain extent recognition too. If I have helped someone in the study group, then I am happy about this too” (IP1).

## Conclusion

At the present stage of evaluation, the research question in the life-world study on what influence life-world factors have on the learning achievement of students in the Bachelor degree course on Education Science at FernUniversität in Hagen has currently produced three core statements.

1. Students in the Bachelor degree course on Educational Science at FernUniversität in Hagen are characterised as a heterogeneous group involved in a large number of life-world areas. The concentration on this target group implies diverse individual learning and acquisition processes.

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<sup>7</sup> IP4: Female, age 50-60, living with partner, no children, trained as children’s nurse and naturopath, teacher for nursing occupations, 4<sup>th</sup> semester of the B.A. in Education Science course.

2. Despite the emerging diversity, it is clear that the singular empirical knowledge is in no way accompanied by competitive mechanisms among students (Ortmann, 1977), but instead it creates learning in solidarity in different learning settings.
3. Studying together improves the learning achievement. The learning form of direct social exchange preferred by all interviewees indicates a certain isolatedness of the students, however. Autonomous action strategies in the individual acquisition of knowledge arises from the individual diversity of life-world contexts, as is confirmed by the life-world shaping according to Kade and Seitter (1999). This results in individual learning speeds. It is possible that this difference in processing time is what impedes studying together.

In metaphorical terms, the different life-worlds of the students in the Bachelor degree course on Educational Science at FernUniversität in Hagen can be compared with musicians who all play different instruments in an orchestra together. Harmony in the piece of music only succeeds in the temporary harmony of melody and rhythm. If this does not happen, we have dissonance. The different learning and processing speeds of the students is the main reason for low activity in Moodle and for the dissolution of study groups. Presumably it is the time flexibility of distance studies, which is viewed as so advantageous, that is responsible for students not being able to study jointly together over relatively long periods.

Neither the conducting of the interviews nor the evaluation of the life-world study have been completed. At present it can be assumed that the analysis process will result in type formation. Currently the types are concentrating on the one hand on fulfilling life's dreams and on the other on realising career prospects.

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## **PROMOTING AWARENESS AND OWNERSHIP IN DIGITAL PROCESSES OF TEACHING AND LEARNING**

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### **Abstract**

This paper addresses the challenge of teaching and learning in a blended, collaborative Digital Context. It reports on a case study in which the promotion of learners empowerment and meta-learning are key objectives. The findings of the case study suggest the presence of a promising potential in a marriage between theory-led designs, digital technology, and dialogic collaborative knowledge building for cultivating and enhancing student empowerment.

### **Introduction**

Collaborative digital e-learning communities and the cultivation of student empowerment through digital technologies are phenomena constituted on the premise that individual learners bring to the learning community knowledge and experience with the aim and potential of generating in a shared endeavour new knowledge for the group. Especially, this is important in domains where new knowledge is developing at a fast pace.

In digital e-learning communities learners are able to generate and share new ideas and concepts in relation to knowledge they have already acquired, and to associate the new generated knowledge with their own professional contexts. In digital e-learning communities, both the individual learner and the entire group of learners gain new knowledge and understandings.

This paper reports on a case study, – a blending learning course where 18 learners with full-time jobs engaged in an online course using a variety of digital environments and Web 2.0 software to facilitate their collaborative learning process. The paper outlines the research design and its ethos in terms of student empowerment. The digital design of the course is described, and the use and delivery process is analyzed.

The findings of the study suggest a promising potential in the marriage between theory-led designs, digital technology, and dialogic collaborative knowledge building in communities of communication and learning for cultivating and enhancing student empowerment.

## Empowering Dialogic Potential of Digital Environments

The general empowering interactive/dialogic potential of networked communication technology for educational purposes is widely recognized (e.g. Conner, 2004; Miyake & Koschmann, 2002, Bang & Dalsgaard, 2008). The educational usage includes communication technologies as e.g. so-called Virtual Learning Environment (VLEs) and Virtual Meeting Environments (VMEs) (Sorensen et al., 2008). Less sustained is the recognition of a similar educational potential of Web 2.0 technologies. While Web 2.0 technologies (also known as Social Software) over the last years have conquered the digital arena in many use contexts, a similar conviction of a potential for education remains to be seen. Nevertheless, according to Dalsgaard and Sorensen (2008), a powerful potential for two main areas of an educational process seems indisputable (Figure 1): (i) *Participation* (dialoguing and stimulating the creation of communicative networks and awareness); (ii) *Production* of digital resources (creating and sharing products).

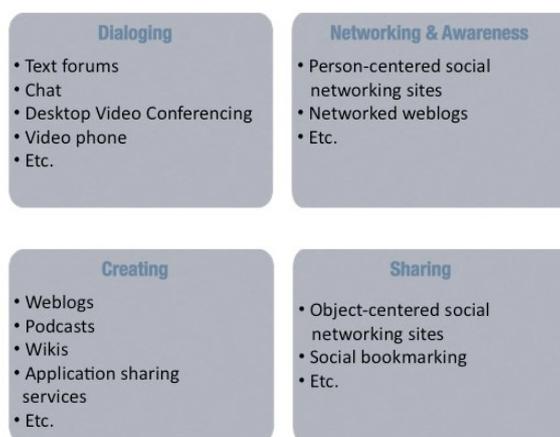


Figure 1. Digital environments for organizing dialogic/communicative processes and resources (Dalsgaard & Sorensen, 2008)

Wegerif (2006a, 2006b) adds a final affordance to the educational visions related to digital technologies when he emphasizes the essential fit between digital technology and education in stating that digital networks offer the possibility for designing environments for teaching and learning in which the facilities of the technology contribute to promoting basic democratic skills, such as learning how to listen to other voices.

## Empowerment and Dialogic Democratic Awareness

Empowerment of learners may be viewed as an essential feature enabling citizens to become active participants in a 21<sup>st</sup> century global intercultural society (Brown & Davis, 2004; Holzl, 1999). Empowerment may be defined as the power to control and ability to control ones own life in a manner that makes space for understanding, influence, and meaningfulness in a way that promotes insight, transparency and ability to act as an active citizen. Empowerment is both a process and a goal in itself (Hoskins et al., 2006; Meyer et al., 2007).

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Both sense and actions of citizenship may be very subtle and personal issues, and becoming an active citizen is likely to be the result of a continuous lifelong process formed by history and relations with others.

A sustainable teaching and learning approach for educating citizens in such a society must feature digitally enhanced pedagogic architectures, which rest on at least two empowering pillars: dialogic participation / negotiation and meta-learning / awareness. The specific characteristics of the competencies cultivated by the two pillars are (Figure 2):

### A. Dialogic participation/negotiation:

- Cultivation of competencies to initiate and participate in digital discussion and shared generation of knowledge (one is active to achieve a common goal) (Stahl, 1999; Sorensen & Takle, 2004; Sorensen, 2008);
- Cultivation of ability to listen to other peoples' opinions and apply *democratic attitudes* and *Ethos* in the negotiation of meaning accompanied by a resulting *intercultural insight*;
- Promotion of a global, *co-existential Ethos* (Sorensen & Ó Murchú, 2006).

### B. Meta-learning/awareness:

- Creation of *awareness* of own learning processes (personal and collaborative e-learning methods);
- *Personalization* in terms of promoting process independence and ownership (Gibson, 2006; Sorensen & Ó Murchú, 2004, 2005) – in a perspective, which is “true” for you (Colaizzi, 1978);
- *Awareness* that you construct your own theories/hypotheses and test them continually in your own life, both in empirical experiments (practice) and in theoretical “experiments” (thinking and thought);
- Meaningful demonstration that whatever you learn is relevant to you, as it is connected to your prior knowledge on the issue;
- Digital meta-learning creates *awareness* of the nature of ones learning processes (Bateson, 1976).

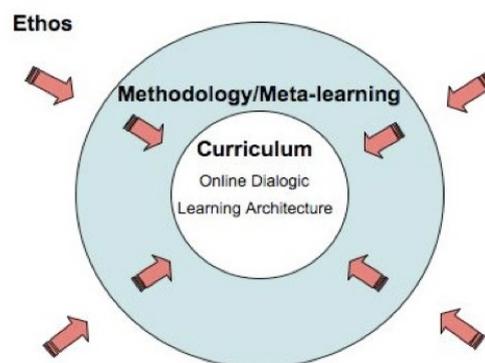


Figure 2. A Meta-Dialogic Approach (Sorensen, 2009)

A digital technology combined with a dialogic teaching/learning strategy is likely to support the education of citizens through conceiving some essential democratic attitudes and intercultural skills of a global citizen, simply because it is likely to leave significant indirect “imprints” (meta-learning) on learners in terms of their self-perceptions and radius of action in their process of becoming global democratic citizens.

Less in focus of dialogic learning is its possible evolvement at the meta-learning level (Bateson, 1976), if invited by the methodology of the curriculum. The learning that is acquired from the methodological level, i.e. “the way things are learned”. Only in the very rare case is it consciously employed (and its value envisioned) in the design of e-Learning curriculum. In other words, the *meta-dialogic level* seems a neglected space of learning.

## Case Study

### *Pedagogical approach*

The pedagogical approach is derived from a theoretical tapestry composed by a Batesonian understanding of the role of learning through reflective communication and meta-dialogue (Bateson, 1976) and the Wengerian view that it is not possible to design learning – only FOR learning through processes of negotiation and legitimate peripheral participation (Wenger, 1998). This means that problem orientation and communicative/dialogic activities are essential, and that the design of the curriculum need to emphasize and incorporate manifestations/activities of *dialogic participation / negotiation* and *metalearning / awareness*.

While the promising profile of new technology and e-learning networks is beyond any doubt, the empowering effect for learners depends to a high extent on design decisions and on the extent to which the new technologies are implemented carefully in the design. These decisions in turn are susceptible to underlying theoretical philosophies and pedagogical methodologies of teaching and learning in ways that may indirectly promote or, alternatively, hamper the advancement of non-authoritarian democratic processes and students’ activity (Sorensen, 2004); in other words, those aspects of the instructional/learning process that are pertinent to aspects of empowerment, i.e. the promotion of learner initiative and entrepreneurship.

This course analyzed in this case study is a master course (15 ECTS) at the graduate level. It is a course on how to design communication and learning processes using digital technology (including Web 2.0). There were 18 participants, all of which were people working full-time in industry and public service areas.

The goal of the course is to provide insight into the challenges related to pedagogic design and facilitation of processes of eCommunication & eLearning in various use contexts. The overall course objectives are that students acquire the skills and competencies to: (i) reflect on and to build and share insights gained through collaborative dialogue, (ii) arrange and organize pedagogically appropriate learning environments across physical and digital spaces, and (iii) design, facilitate and moderate (collaborative) processes of eCommunication and eLearning.

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The overall *pedagogical intentions* of the course design are in line with the overall theoretical ambition reported on in section III focusing on promoting learner empowerment and emphasizing meta-dialogue and dialogic behaviour. More precisely, these pedagogical intentions include:

- To promote the view of “*dialogue as the curriculum*” (in both small and plenary groups);
- Promoting meta-dialogue;
- *Bringing self-experience and self-reflection* up-front, as the course itself was an example of a “design of communication and learning”, incorporating all of the digital technology treated as part of the subject area;
- *Operationalizing and sharing of learners prior knowledge* coupled with theory in the shared knowledge building process online (small groups identified problem and presented/debated in plenary);
- Supporting *peer-review* processes between groups;
- Promoting the concept of the course as a laboratory for *experimentation*;
- Promoting an understanding of the teacher’s role as a *cultivator* to fertilize the ground for learning, a *co-participant* to co-experience co-interact and share, a *weaver* and a *facilitator* to sort out during the delivery process as-we-went-along.

### Design of module

To indicate the importance of dialogue, the overall proposed understanding of the course was “dialogue as curriculum” (Sorensen & Ó Murchú, 2006). The traditional 12 3-hour face-to-face lectures were broken down to only 3 full-day face-to-face meetings, while the remaining teaching and learning took place using a variety of *digital technology*:

- AULA (the basic course space);
- CONNECT (a desktop conferencing system, with whiteboard, used for presentations and mediated face-to-face dialogue);
- AULA-plenary text fora and meta-fora (for both involved and meta-level dialoguing and debate);
- AULA-small group fora and spaces (for managing process and for creating and preparing “items”);
- AULA-chat (a real time text-chat feature of AULA, used for summaries);
- Weblogs (for personalization and reflection);
- Skype (for supervision).

The *resources* of the course included all kinds of relevant digital material and research papers available online as well as other online applications and resources. It also incorporated through more formal presentations at the face-to-face meetings experiences and insights of the work contexts of participants.

According to the assignment given, the participants, in the two-week preparation periods, had to, individually, make themselves familiar with the literature/resources given and prepare in

their small groups plenum presentations to be presented mediated face-to-face using the desktop video conferencing system, CONNECT. They were asked to finalize their presentations with a set of related questions/problems for succeeding debate in the AULA forums.

Following the CONNECT presentations and based on these final problems raised, the groups continued the debate through text-based dialogue and negotiation in the AULA plenum fora. The small group members were asked to distribute a set of roles among their small group (on average consisting of 4 participants). The roles were supposed to form, support and guide their later discussion and to give the participants a concrete point of departure in the discussion. Some were presenters, some moderators, etc. The description of the roles was clarified in detail in the assignment. Both teacher and students agreed on committing themselves to attending the text-based discussions for a minimum of five times a week over the two weeks of debate. In the debate period each of the groups were asked to present, in the plenum forum, an identified problem related to literature, experience, etc. They were asked to initiate, conduct and wrap up the succeeding online plenum discussion that evolved from the problem of their group. In parallel with the discussions, the participants and the teacher were engaged in continuous individual reflections (using weblogs) and meta-reflections and meta-communication in a meta-forum (in AULA) to reflect and discuss the experiences and the observed processes of their own communicative behaviour, as it evolved.

To explore the AULA-chat feature, the groups presented their wrap-up summary dynamically in a text chat session. The next task in the delivery plan was to work on (in the small groups) and hand in an assignment, using AULA. Finally, the small groups prepared their feedback on each other's work to be presented at the next face-to-face meeting.

The module went on with a second iteration of the above described cycle, before finally starting to prepare the exam paper, while receiving, in parallel, supervision from the teacher. The participants were graded, as described in terms of both quantity and quality of their contributions (Stahl, 1999; Sorensen & Takle, 2004). In this case, the teacher defined "active participation" (and succeeding pensum reduction for the final exam project) on the basis of the following participation criteria:

- Attending 2 of 3 face-to-face meetings;
- Weblog contributions: minimum 5;
- In 2 times 3 weeks of online discussion period: 5 contributions per period per person. 2 should be initiating and 3 responding;
- Collaborate on group assignments A + B;
- Attending 2 out of 3 Connect meetings.

### ***Design of module3? – Findings***

The delivery process (following the outline in Table 1) mirrored a student-centred, open process in which knowledge resources entered dynamically from outside (student's work contexts, student's experiences, student-identified resources from the internet, etc) via the

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participants as well as through the teacher. This process was driven and motivated by participants and their individual prior knowledge and engagements. The latter is an important fact in adult education, where all participants are “experts” in each their individual working context.

The course was evaluated using a semi-structured questionnaire and free style comments in an online evaluation forum in AULA. The evaluation produced 12 (of 19) student responses. There were four options for replying in the structured part of the questionnaire: a) yes, to a high extent, b) yes, to some extent, c) yes, to little extent, d) no, not at all. The following table shows the students’ responses to two focus areas (Table 1):

Table 1: Student evaluations

	a) yes, to a high extent	b) yes, to some extent	c) yes, to little extent	d) no, not at all
1: YOUR OWN LEARNING Students were asked if they felt they had acquired the qualifications and competencies described in the course objectives (i.e. had the 3 course objectives been fulfilled)	4	7	0	1
2: COLLABORATION AND ENGAGEMENT Students were asked if they felt the course had enhanced their ability to communicate and collaborate with others (i.e. had they achieved an increased level of empowerment)	6	5	1	0
3: DESIGN OF THE COURSE (LEARNING ARCHITECTURE/ENVIRONMENT) Students were asked about the form of the course (incl. variation and whether the course invited independence, initiative and ownership)	5	6	1	0

Some additional qualitative free style comments were:

*“It was difficult to grasp the focus of the course, but it was exiting that the course construction itself was an integral part of the course”*

*“Too much reading”*

*“The learning achieved came especially through group work”*

*“One part of the learning was disturbed by CONNECTs limitations. This was sometimes frustrating, when the participants had spent time on preparation, which was sabotaged technically. But – having second thought considerations – this is exactly the situation that we are likely to put people in”.*

*“I have experienced great engagement and commitment in both the small group and large group activities”*

*“I have been happy for both face-to-face and online activities, my study group has functioned very well. Lots of praises to the teacher for the handling of the group selection process”*

Viewed from a teacher perspective, the content of the discussions turned out to be of a rather good quality. The delivery of the course was characterised by a high degree of student participation, self-experience and self-reflective dialogic engagement. Interests in the experiences and engagement was driven by peers, as was operationalization of these in the shared dialogic process characterized by participant “ownership”, equality in teacher and learner roles (dynamically interchanging roles), and assessment of dialogic process and product. The teacher occupied a role in the discussions equal to the students. Only in the meta-forum, the teacher shifted between the role of participant and the role of “the expert”. The teacher’s role became one of a cultivator to fertilize the ground for learning, a co-participant to co-experience co-interact and share, a weaver and a facilitator to sort out during the delivery process as-we-went-along.

The evaluating comments from the participants documented that, in general, the course had been perceived as a positive experience. Some participants initially found it to be a stressing experience, especially due to a too large amount of readings. A smaller part of the participants expressed some frustration that the course did not have the more traditional roles of a teacher (the one who knows) and a student (the one learns from the teacher). Nonetheless, most of the time the course delivery process produced dialogic presence and engaged communicative participation.

## Conclusion

This study has investigated the challenge of teaching and learning at a graduate level in a blended, collaborative digital learning context, composed by face-to-face elements, a virtual learning environment (AULA), a desktop video conferencing facility (CONNECT), a chat facility (in AULA), a weblog facility (blogger.com). The underlying ambition behind the course design was to try to design for an indirect promotion of learner empowerment, meta-learning and reflective meta-dialogic behaviour.

A tentative conclusion is that the findings from this case study (student responses from the questionnaire) show some indication that this course and its combination of pedagogical design, digital learning architecture (including Web 2.0) and (meta)dialogic collaborative knowledge building promotes development of learner empowerment and meta-dialogic learning and awareness. Dialogic meta-awareness and the resulting visibility to meta-inspect ones own competencies and communicative actions seem to create the personal initiative and the transparency needed to implement and maintain democratic forms and attitudes in intercultural participation, negotiation and dialogue.

It seems nearby to conclude that the course to a certain degree seem to have increased student empowerment through enhancing student initiative and incitement to express opinions and

dialogue with peers. However, a remaining issue to investigate further and possibly to resolve is the more specific affordance of each technology in this respect, and to identify more the more specific correlations between each of the technologies and the activities implemented in the blended learning architecture across spaces and media.

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## **THE CHALLENGES BEHIND RESEARCH-BASED PRACTICES AND PRACTICE-FOCUSED RESEARCHES IN DISTANCE EDUCATION**

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### **Introduction**

Scientific research was generally categorized as pure basic research (Bohr), pure applied research (Edison), and use-inspired basic research (Pasteur). There are many studies carried out to present the relationships between these research types and present their superiority in the field of philosophy of science. In this study, the relationship between research and practice has been discussed within the scope of distance education based on institutional experiences rather than discussing the perspective of philosophy of science.

Ataturk University Distance Education Application and Research Centre (ATAUZEM) is one of the leading distance education centres with the variety of programs of study offered in Turkey. This centre was established in 2008 to bring research and practice together. ATAUZEM has offered a variety of distance education programs from associate programs to undergraduate completion program, from campus-based courses to masters -without thesis- programs. ATAUZEM, with 23,500 distance education graduate students, has currently 3,200 active distance education students and each semester has about 15.000 active on campus students.

This study is based on six years experiences of a team of distance education practitioners in ATAUZEM which is composed of two parts. In the first part of the study, it has been explained that why practitioners could not adequately benefit from research findings during planning and designing of distance education programs. In the second part, challenges behind producing practical results or why distance education research is limited in practical use have been discussed.

In this sense, the aim of present study is two-fold:

- to understand challenges behind research-based practices in distance education;
- to understand challenges in undertaking practice-focused researches in distance education.

It is expected that understanding challenges behind research-based practices and practices-focused research will contribute to the expansion of appropriate distance education program

models. Understanding these challenges will also help distance education researchers to take precautions before conducting their studies.

### Challenges behind research-based practices

In this part of the study, impact of low and high research support (L-HRS) on effectiveness of practices (EP) is modelled in Figure 1. According to this model, HRS-EP represents ideal case where practices are designed based on research findings and practitioners used these findings appropriately. It can be claimed that the likelihood of distance education program success is in the highest level for this case.

In LRS-EP, research findings could not support practice but distance education program can be effective because of experiences or tacit knowledge of the practitioners who are experts in the application of a variety of forms of distance education. Although in this case practitioners' tacit knowledge can intuitively guide educational decisions and effectively facilitate the program, it is not beneficial in directing new research and producing new model and theories (Simonson et al., 2009).

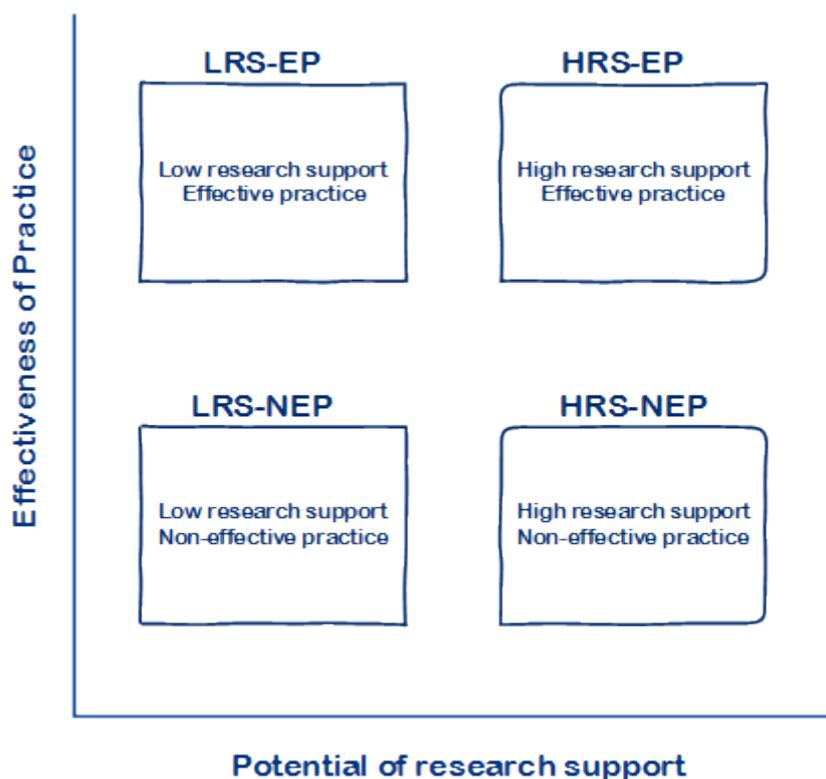


Figure 1. Research support on effectiveness of practices

Actually the focus in this study is LRS-NEP and HRS-NEP because they are not effective distance education programs. Take HRS-NEP for instance, it was designed and developed in line with the research findings but the program is not effective. Our experiences showed that stakeholders' (teachers, students, personals etc.) negative attitudes toward distance education or their resistance may prevent successful integration of the research findings into distance

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education programs. Apart from this, sometimes theory has a negative effect on practice. That is, research findings don't work in practice as expected. Organizational and structural constraints are also main reasons behind failures of this type of programs. While designing a distance education program, time, financial resources, human resources can be regarded as a constraint. Therefore, instead of research findings, current resources can be main factors while designing distance education programs.

As for LRS-NEP, this might be the worst case in distance education practices because there is lack of research findings or theoretical frameworks that guide design and implementation of distance education program. In other words, for this case distance education literature does not provide practical solutions to distance education problems. For instance what would be the optimal student number or optimal time in live class session? What makes a live classroom session successful? These are some questions that we want to find literature support for these practical problems we faced. Beside lack of research findings, when practitioners have no experiences about the issue, then the program is likely to fail.

### **Challenges behind practices-focused researches**

In this part, different challenges in undertaking research which yields practical results for distance education problems are discussed. These challenges are briefly discussed considering main scientific research components (e.g., research design, sampling, data collection etc.) in the following sub-titles.

#### ***Challenges in conducting experimental studies***

Experimental studies, where variables are under control and subjects are randomly distributed, are the most conclusive research methods (Fraenkel & Wallen, 2011). However, nature of the distance education does not well fit with experimental studies because of its defining characteristics; the distance (Bernard et al., 2004). Distance education students are working self-paced, wherever and whenever they want, therefore it is difficult to keep track of their study time, their interaction with materials, and allocated time for the activities. In addition, obtaining valid achievement scores, receiving informed consent form, communicating with participants, and assigning students to groups randomly are the main challenges while conducting true experimental studies in distance education (Bernard et al., 2004). As a result, there is a lack of true experimental studies conducted on distance education in the literature. In general, research studies in distance education are related to specific cases. As founded in their review study, Zawacki-Richter, Bäcker and Vogt (2009) indicated a significant positive trend towards more qualitative research in distance education. Therefore all these issues make it difficult to produce practicable or generalizable findings.

### ***Challenges in valid and reliable data collection***

There are some limitations during data collection in research studies of distance education. It is difficult to conduct face to face interview with distance education students. There is a low participation rate in online surveys (Bernard et al., 2004). As a powerful technique of obtaining detailed information, conducting observation is also hard to do in distance education studies. All these challenges affect validity and reliability of research studies. This may be one of the main reasons of distance education research yields few conclusive results.

### ***Heterogeneous sampling***

The student groups are heterogeneous since distance education programs allow students enrol from different regions, with various prior knowledge, experiences and cultures in general. There is also no age limitation. Therefore the generalizability of findings of the research has been decreased and this situation directs the researchers to specific research designs, which compel them to work on more focused groups.

### ***Various dependency of distance education***

Since distance education is dependent on various variables such as platform, technology (Garrison, 2000), context, structure, process, procedure and legal issues, these variables should be taken into account in the research. For instance, online examination cannot exceed 20% of total grade of the course according to the regulation of distance education in Turkey. Because distance education is dependent on all these variables, generalizability of the findings has been affected negatively.

### ***Lack of consistent terminology***

Another difficulty in distance education literature is the lack of consistent terminology. Even in main concepts such web-based education, online education, e-learning, there is no consensus. These terms can be used in the literature interchangeably. Garrison (2000) has stated this issue as “conceptual confusion is created with the advent of new terminology (virtual, open, distributed and distance education)” (p.1). This lack of common terminology especially prevents practitioners from finding related information from the distance education literature.

### ***Lack of theoretical framework***

Another problem faced in literature related with distance education is lack of theoretical framework. Garrison (2000) defines theory as “a coherent and systematic ordering of ideas, concepts, and models with the purpose of constructing meaning to explain, interpret and shape practice. Theory can provide a perspective that reduces complexity while suggesting generalizability” (p.3). Keegan (1988) has stated that “lack of accepted theory has weakened distance education” (p.63). Similarly, Holmberg highlighted the same problem that “distance

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education has been characterized by a trial-and error approach with little consideration being given to a theoretical basis for decision making. He suggested that the theoretical underpinnings of distance education are fragile” (Simonson et al., 2009, p.42). Therefore, lack of theoretical base in distance education is a significant problem since the theory has a direct impact on the practice of the field (Schlosser & Simonson, 2002). It is theory that guides not only practitioners but also researchers by providing a coherent ordering of relevant variables and relationships (Garrison, 2000). As a result, the lack of theoretical framework makes it difficult to provide applicable suggestions for distance education practices.

### **Conclusion and Suggestions**

The aim of this study is to understand challenges behind research-based practices and practices-focused research in distance education. It is clear that there is a serious gap between theory and practice in the field of distance education. In order to close this gap, every stakeholder should take their responsibility. First of all, to ensure successful practices, these practices should be based on sound theoretical underpinning. So main aim of all stakeholders in distance education should leverage research studies and practices to HRS-EP level (see Figure 1). To do this, different suggestions can be proposed to practitioners, researchers and leaders in the field of distance education. Practitioners can convert their experience, trial and errors or tacit knowledge into research findings (LRS-EP to HRS-EP). They can propose practitioners guidelines combining their tacit knowledge together as well. Instead of undertaking research isolated from practices, researchers can conduct practice-focused research (i.e. design-based, developmental research) by considering challenges behind it (HRS-NEP to HRS-EP). To decrease level of challenges, they can be more careful in the selection of research design, detail explanations of sampling, environment, and procedures in their research studies in order to ensure transferability of their practical findings into different cases correctly. Finally leaders or organizations (e.g., EDEN, ICDE) in this field should take main responsibility of structuring consistency in distance education terminology and proposing new theoretical framework for distance education.

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## **LEARNING ANALYTICS IN PRACTICE: SETTING UP A LABORATORY FOR ACTION RESEARCH AT THE UNIVERSITAT OBERTA DE CATALUNYA**

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### **Introduction**

Since its inception in 1994 as a purely online university, the Universitat Oberta de Catalunya (UOC) has been able to position itself among the main universities of the Catalan and Spanish university systems. Most of the students at the UOC (currently more than 60,000) are adults who have a profile that could hardly fit into the traditional university system, thus finding in the UOC an opportunity to start or continue their higher education grades, in a very innovative environment. The intensive use of ICT for both the teaching/learning processes and management allows researchers and practitioners to obtain data about what takes place in the UOC Virtual Campus, which is continuously being improved according to such findings.

The e-Learn Center – the UOC’s e-learning research and innovation institute - is the element that the university avails of to facilitate applied research in e-learning, to foster innovation in this area and to convey both internally and externally that e-Learning is a constituting element of the university’s identity. The role of the eLearn Center in UOC is two-fold. Internally, it plays an active role in ensuring that research, innovation and practices at UOC are constantly feeding into each other, with the purpose of improving the quality of the students’ experience. Externally, it seeks to reaffirm and improve UOC’s position in the international arena by strengthening international contacts, supporting the publishing and dissemination of applied research and innovation results and making the UOC environment a place of interest for researchers.

Besides virtual learning environments, there are external variables that have also affected the way students act and interact with the UOC. These include the creation of new degrees according to the Bologna model, which introduced the concept of competence but without resolving its connection with traditional learning resources, and the economic crisis that has caused modifications in the enrolment patterns of the students (currently now they are enrolling in fewer courses each semester). In addition, the increased (eclosion? Xxx) use of mobile devices, specially smartphones, has changed the way students access and interact with learning resources and other actors in the university, as well as opening new opportunities in learning and teaching processes. In parallel, new movements such as OER (Open Educational Resources) and the MOOC (Massive Open Online Courses) phenomenon generate changes in

the area of higher education that require careful consideration for their integration into our educational model.

In this scenario, one of the challenges is how to analyze all these changes from a perspective wide enough to understand the relationships among them as well as the implications in the student and university interaction. This is why the eLearn Center aims to provide both the framework and the ground for implementing these changes in a controlled environment, measuring their impact, collecting the necessary data and evaluating their scalability in order to convert every teaching experience into a good practice, facilitate rapid adoption and dissemination. In doing so, the eLearn Center ensures the continuous contribution of the UOC to e-learning research and innovation.

Consequently, all the eLearn Center activities follow a continuous cycle of analysis, design, implementation and evaluation, focusing not only on the student but also on the whole teaching/learning process, which is generated in the interaction (in a wide sense) between users (mainly students, teachers, tutors and mentors), services and resources. It should be possible to capture this interaction, analyze it to detect strong/weak points and, to propose solutions that may be swiftly implemented and evaluated. In this way the acquired knowledge is reintroduced into the learning scenario, repeating this process as needed.

In this paper we describe how the eLearn Center addresses the problem of both supporting and analyzing UOC's educational model whilst providing teachers, researchers and practitioners with an experimental space where they can design and implement new educational practices. We provide also an example of the kind of analysis that can be carried out within this framework.

## **The UOC as a laboratory**

The UOC, as a result of a bold and successful decision to bring its activity online from the moment it was founded in 1994, has become a laboratory for e-Learning, and expertise in applied research in eLearning can only follow from this. Such expertise is not based on the reputation of individual researchers' production only, but on the university's ability to provide an experimental ground that can attract researchers of the field. The role of the eLearn Center is to plan for the full realization of UOC as a e-learning laboratory potential by means of managing effectively innovation synergies, supporting big data analysis, and having an active role in the design of our educational model, internal faculty/staff training schemes and a strong, innovative and well-informed technological strategic plan that can match the UOC's first decision to become a virtual university. Therefore, the eLearn Center provides support to the following domains:

- UOC educational model: this area is in charge of the application of the educational model as well as the evaluation of its implementation. It ensures the constant update and evolution of the model with the definition of instruments, environments and the

methodologies that comprise it. In order to do so it is informed by applied research results and educational innovation developments, at the same time as it incorporates the latest pedagogical and technological trends.

- Innovation: the mission of this area is to promote an innovative university, as opposed to a university which only does innovation. With this objective, using a combination of bottom-up and open innovation approaches, as well as transversal and strategic projects, a culture of innovation is created.
- Applied research: the objective of this area is to facilitate and encourage the use of the UOC as a laboratory by teachers and researchers taking advantage of the data available on learning and teaching processes with ICT. The priority here is to foster research about the activity of the UOC itself, and applied to the areas of knowledge that are taught in the institution.

The eLearn Centre's Virtual Laboratory offers instruments and a space for experimentation to the three areas above described with the aim to foster change. It is a virtual space with the infrastructure, instruments and tools necessary for designing, executing and analysing new scenarios in e-learning. The eLearn Center Lab, thanks to a Cloud Computing concept, allows teachers, researchers and management staff in the UOC to experiment with new initiatives and pilot them in a flexible but yet controlled environment. It is also in this Lab where the overall strategy for the use of learning analytics in applied research on the UOC eLearning activity is designed.

### ***Managing big data***

As summarized by Siemens and Gasevic (2012), learning analytics is defined as “the measurement, collection, analysis and reporting of data about learners and their contexts, for purposes of understanding and optimizing learning and the environments in which it occurs. ... High expectations exist for learning analytics to provide new insights into educational practices and ways to improve teaching, learning, and decision-making.” The importance of this new research field is demonstrated by the enormous attention that it has recently received, as well as the existence of several conferences and journals devoted to this topic.

One of the main concerns for any educational institution aiming to do learning analytics on its data is, precisely, how to capture and maintain such data in a simple datamart<sup>1</sup> that allows researchers to further analyze it according to the designed experiments. Obviously, the intrinsic nature of each institution determines which data is available for analysis purposes. If learning analytics is an instrument that the eLearn Center uses to better understand and improve UOC's educational model, we need to establish different levels of analysis, depending on the nature of each problem being addressed and the context, in this case online / distance higher education. In the case of a virtual learning environment such as UOC's Virtual Campus, the amount of available data is huge; at every moment there are tens of thousands of users interacting with thousands of services and resources, thus satisfying the three Vs of the

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<sup>1</sup> A datamart is the access layer of the data warehouse environment that is used to get data out to the users.

“big data” definition: volume, variety and velocity. This generates a large (and sparse) cube of data that cannot be analyzed as a whole; we need to define different levels of analysis (Mor et al., 2007) according to the desired research goals, as follows:

- Session level: what does the learner do when s/he connects to the Virtual Campus? This level captures the way users navigate with particular goals in mind. For example, how users use the e-mail service or how they access to the proposed exercises. At this level, the short-term navigation behaviour is studied. In this case, a web mining analysis could be helpful to detect problems with the web interface, for automatic usability evaluation purposes (Ivory & Hearst, 2001).
- Semester level: what does the learner do during an academic semester? This level tries to join all the single user sessions in a continuous flow during a longer period of time, with a limit of an academic semester. This medium-term navigation behaviour will be useful to validate hypothesis about the relationships of user actions and her results, which are related to the way learning resources are organized. The main goal of this level is to determine the navigational patterns followed by users but at a higher scale than in the previous level. For example, it is interesting to study whether students connect every day or not, or whether they make an extensive usage of the virtual classroom forums during the weekend or not. All the information collected at this level could be used to feed an intelligent tutoring or adaptive hypermedia system; see (Brusilovsky, 2001) for instance.
- Degree level: what does the learner do from the time of enrolment until s/he finishes (or abandons) the degree? Finally, this level can be considered a long-term navigational behaviour analysis. In this case, the main interest is to analyze how students evolve from the beginning of a degree until they successfully finish it (or less successfully, they drop out). This includes the study of several stages in the student life-cycle: first contact and university access, first and following registrations, etc. Performing a data mining analysis at this level could help tutors and mentors to choose more carefully the subjects each student is enrolled to each semester, for instance. At this level it may be also interesting to discover inappropriate combinations of subjects that might lead to an excessive teaching burden.

Each one of these levels needs different data in order to answer the established research questions. In fact, the Virtual Campus is a rich scenario for experiment design, as different research questions involving different analysis levels can be imagined. Depending on the available information (collected usage data, surveys, academic results, etc.) and the desired goals, different experiments can be designed. Following the same approach, the datamart can be designed as follows:

- At session level, each Virtual Campus service executed by a user generates one or more tuples according to the following abstract model:  
(U <id>, T <timestamp>, S <id>, R <id>, X <id>)  
That is, user U (identified by <id>) in moment T applies service S to resource R with

result X. If all available services at the Virtual Campus follow this approach, it would be possible to create a small datamart for each service (or group of services), thus simplifying further analysis. That is, the institutional learning environment could define a set of available services and store only all data regarding such services to a specific datamart. On the other hand, if there is an experiment involving the use of an intelligent tutoring system for a particular course, those data will be stored in a different datamart. With the support of the eLearn Center, each teacher, researcher or practitioner will need only to define the semantics for the set of services, their scope (that is the resources where the service can be applied to) and the possible results for a given experiment. The eLearn Center laboratory will provide the place where to implement and deploy such experiments.

- At semester level, we can obtain additional information regarding user activity: her academic performance, her motivations, expectations and satisfaction (by means of one or more surveys) and a summary (i.e. aggregated) of her navigational behaviour using the aforementioned session level data. All these data also uses the same abstract model previously defined. In this level we are only interested in what is happening in the current semester, thus keeping a reasonably small datamart.
- At degree level, we maintain a huge datamart with all historical data from previous semesters, including also any other information relevant to user profiles (i.e. age, gender, previous academic background, special requirements, and so) in different databases.

Therefore, experiments are executed in the laboratory, feeding one or more session and semester level datamarts. At the end of each semester, once all the desired data has been gathered, the semester level is dumped on the degree level (or historical) datamart. Depending on the research questions, the researcher does not need all the available data but only those related to her level of analysis.

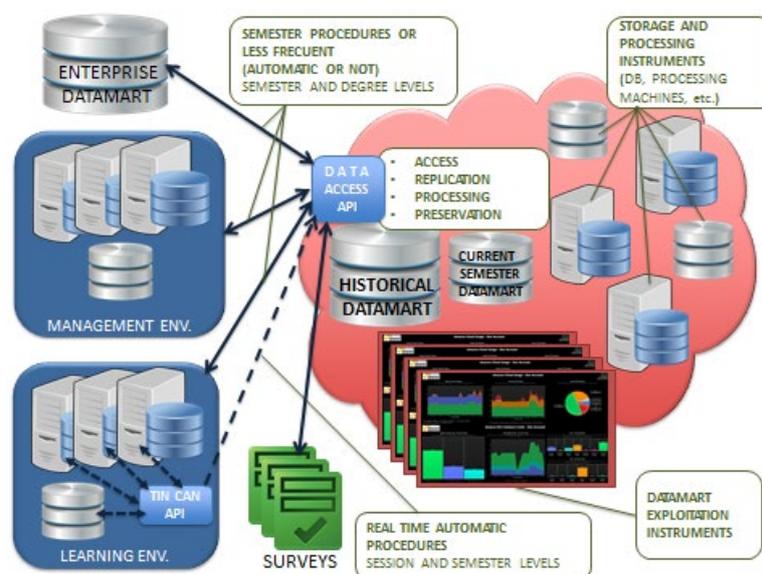


Figure 1. The UOC's Learning Analytics infrastructure and procedures

## Case study: analyzing dropout

University dropout is a major issue and should be seen as a failure of the higher education system to create an outcome (graduates) after having invested a significant amount of resources, normally publicly funded (OECD, 2012). However, the financial costs of dropout are only part of the total costs: Non-pecuniary (or affective) costs –more difficult to measure – are also important for dropout students (Johnes, 1990). It should be noted that university dropout is a multidimensional phenomenon that needs to be correctly defined before any thorough analysis of its causes can be carried out. One of the authors who has put great emphasis on creating a university dropout doctrine is Vincent Tinto (1975). Tinto stresses the importance of reaching a good definition of university dropout, which he sees as essential as detecting the causes of this dropout. In a more recent vision, Lee and Choi (2011) have reviewed research on online course dropout. The results of this analysis reveal that so far research has focused mainly on analyzing the causes of dropout on a course level.

Analyzing dropout is a perfect example of how the different data gathered and stored in one or more of the available datamarts can be combined into a single dataset for analysis purposes. Preliminary experiments (Grau-Valldosera & Minguillón, 2014) show that taking a break during the second semester is a clear sign risk of dropout. These experiments use the following data:

- From the degree (historical) datamart:
  - User profile: age, gender, work status, family status and so. This information is gathered during the first enrolment (the first academic semester) and stored in a database within this datamart.
  - Academic background and previous higher education experience.
  - Courses enrolled during her first semester and the academic performance for each course. This might include aggregated indicators summarizing the activity in each course, i.e. the number of times the user has interacted with a specific tool or resource.
  - Aggregated data from her navigational behaviour: number of connections to the Virtual Campus, average connection length, etc.
  - Any other aggregated data summarizing the use of other services available through the Virtual Campus, such as the number of accesses to the Digital Library, the interaction with her tutor, and so.
  - Finally, any other information that may be gathered through surveys during the first semester, including motivations to study the degree, expectations and so. Notice that this information may not be available for all users.
- From the semester (current) datamart:
  - The fact whether the user is enrolled or not in the second semester.

With all these data, researchers are able to build complex models trying to discover and explain underlying patterns and reasons about why students drop out. The eLearn Center acts

as a promoter, curator, facilitator, data custodian and disseminator, providing a holistic framework for both research and innovation in the field of online education.

## **Conclusions**

Although both traditional brick-and-mortar universities and online / distance ones have been using virtual learning environments since some years ago, it has only been recently that such institutions have seriously considered the opportunities that the analysis of such huge amounts of data brings. In this respect the large volume of learners and the intensive use of educational technologies made by the virtual campus users place the UOC in a unique position to carry out evidence-based applied research. For this it is necessary that UOC researchers have at their disposal the needed instruments and well defined protocols for to gather and exploit data for the research and improvement of learning and teaching processes. This kind of applied research is key for one of the main missions of the eLearn Center, that of guaranteeing the quality of the UOC educational model by evaluating it and improving it continuously.

In UOC, the eLearn Center acts as a bridge between applied research on online education and technological development. “Pedagogy should not be subject to technology, this statement has been a great matter of concern and used as a sign of quality in e-Learning. Likewise, technology cannot be limited by pedagogical principles based on face-to-face teaching. The way technology has become part of our lives today influences how we communicate and interact with technology opening up new possibilities that may not have been possible in a f2f educational context. The true potential of e-Learning in the context of the UOC is realized when balance is achieved and both pedagogy and technological development walk hand in hand. Innovation is what makes this possible.

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## **PEER REVIEW OF OER IS NOT COMPREHENSIVE – POWER AND PASSION CALL FOR OTHER SOLUTIONS**

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### **Introduction**

Sustainable development is often interpreted with reference to the World Commission on Environment and Development, meaning that ‘the needs of the present’ should be met ‘without compromising the ability of future generations to meet their own needs’ from environmental, economic, and social perspectives (WCED, 1987). Scientific research is of course of highest importance when defining, elaborating and implementing policies for sustainable development, but nevertheless sustainable development is most of all a normative concept, rather than a scientific one (Abrahamson, 1997). It implies a moral duty to develop the society with an emphasis on improving the state of the environment, as well as socio-economic and environmental living conditions for present and future generations.

Food quality and animal welfare are aspects of sustainability which are of high interest not only to scientists and students but also to citizens and consumers. Consequently, food quality and animal welfare have legitimacy because of ethical concerns in the society rather than only because of researchers’ curiosity. If the conception of food quality and animal welfare used by scientists are different from, or narrower than, the conceptual understanding by citizens and consumers, their findings may fail to address the issues of concern in society. To access the adequacy of those scientific conceptions the research community must therefore be in dialogue with society and address the current ethical concerns.

Consequently, dealing with complex issues, such as food quality and animal welfare, that are inherent in developing a sustainable society, requires a process of learning by every member of society. Such learning must also continue throughout life, as an ongoing adaptation to emerging challenges and new scientific findings. This can best be achieved when the learning is based on curiosity, inquiry, and collaboration, and grounded in real-life experience and situations. Such social interactions both mediate and are influenced by the learning process and constitute the basis for social learning. Thus, food quality and animal welfare are two such fields, in need of social learning processes.

Higher education has a societal responsibility to formally educate students and to be involved in informal learning of members of society. Individuals need to be assisted to become more aware of the complexities surrounding ethical decision making and more conscious of their

own ethical orientation in the contested areas of food quality and animal welfare, in order to make informed consumer choices, influence the food production methods and levels of animal welfare and articulate their stance in sustainable development. Both the search for a sustainable world and for social learning models draw attention from different activity systems of research, education, community organising, business and industry, policy making and governance (Wals & van der Leij, 2007).

OER practice is a methodology for meeting the challenge of an increasing and widening participation in higher education, and has the potential to be an important new learning approach for social learning towards sustainable development. The term Open Educational Resources (OER) was adopted at a UNESCO meeting in 2002 to refer to the open provision of digitized materials, enabled by information and communication technologies, for consultation, use and adaptation by a community of users for non-commercial purposes. The model of sharing learning materials openly and for free is well established but the quality of OER is one of several challenges (McAndrew & Farrow, 2013), affecting trust in educational value and thus adoption.

Nevertheless, the lack of quality assessment systems for OER can explain low OER adoption in educational institutions (Kanwar et al., 2010), since faculty involved in formal learning are used to peer review system for quality assessment in research and education. In research peer review of scientific articles is the norm and is related to trust (Smith, 2006; Iiyoshi & Kumar, 2008), and in higher education the traditional resources used are scientific articles and textbooks, which also most often have been exposed to some kind of review.

But when focusing more on the learners and less on the educational institutions, the question is not if the OER is accurate, in the sense without errors or demonstrating scientific reliable results, but if it shares with you the value-laden presuppositions about what is important. A reflexive approach to moral questions that arise in the subjects of food quality and animal welfare may strengthen our ability to respond creatively to the deeper and profoundly existential qualities of the global food system and thus of sustainable development. Moral frameworks can complicate binaries, such as right or wrong – selfish and selfless, and generate natural understandings such as protect, rather than prey upon, the weak; and apply expertise for the betterment of society (Sharp, 2009).

## **Aim**

The aim of this article is to support the discussion on the role of OER for sustainable development by i) highlighting the need for a critical debate on issues related to quality of OER and ii) emphasizing that both accuracy and legitimacy is essential for quality.

This article presents empirical research highlighting the interplay between accuracy, meaning if the content is current knowledge without errors, and legitimacy, meaning if the content is relevant to the learner and based on the value system of the learner or the general accepted value system in a certain context. It highlights the power structures and question if higher

education has the authority to be the main assessor of OER in the future, and if peer review is the only and preferred methodology for quality assessment. It asks the question if the wisdom of the crowd and its demand for knowledge is building the legitimacy of OER and how that corresponds to the quality assessment of OER, and therefore how this might contribute to a sustainable development of society.

### ***The problem of quality assessment in OER***

Gibbons et al. (1994), stated already twenty years ago that “peer reviews are no longer the dominant method of quality assessment; social relevance has become an increasingly important criterion when assessing results”, and it has been suggested that the future quality assessment of OER will be conducted by a combination of learners and peers (Ehlers, 2006; Clements & Pawlowski, 2011).

Nonetheless, peer review is generally the preferred quality instrument seeking to maintain academic standards and objectivity (Smith, 2006). Alternative quality instruments are ratings, recommendations, and benchmarking, the latter are not many academics familiar with (Clements & Pawlowski, 2011). Different types of index are sometimes used in peer review based on tools which measure different dimensions. Such tools tend to be instrumental and some academics are considering other approaches contesting quantification.

However, the process of peer review has been criticised for neither being standardised and objective, nor reliable for detecting fraud, and for being time consuming and expensive (Smith, 1988; Horton, 2000; Smith, 2006). A strong evidence for bias against women when awarding grants has been revealed (Wennerås & Wolf, 1997) and reviewers have been found to steal ideas and block or slow down the publication of scientific results of competitors (Smith, 2006).

The view on OER as an artefact is fundamentally wrong and should be changed to OER as a process (Kanwar et al., 2010). Atenas and Haveman (2013) suggested changing focus in quality assurance from the OER to the repositories for OER, because the technical infrastructure underpins the OER activities. Consequently, they found that only 11.5% of the reviewed repositories had established formal peer review procedures, which they claimed is an efficient and reliable method to ensure resource quality, but explained the low incidence with this method being resource intensive. We question this methodology not only because peer-review generally is criticised, but also because evaluations of OER repositories are not comprehensive since the activities related to the individual resources need to be evaluated.

Gourley & Lane (2009) argued with reference to the wisdom of the crowd that collectively developed resources are of higher quality than those the individual can develop on their own. Thus, the social development can be seen as a collegial activity similar to the creative exchange in research when researchers are building upon each other’s work and discuss their findings with fellow researchers in order to get a shared understanding (Iiyoshi & Kumar, 2008), and

these social activities can be seen as an integrated, open and formative peer review, “conducted in real time in front of the eyes of anybody interested” (Smith, 2006).

Furthermore, quality assessment of OER in subjects related to normative assumptions (on a scale from good to bad) can be debated, since what is good quality to one is not acceptable to the other (Camilleri et al., 2014). The conceptions of contested subject areas such as food quality and animal welfare that scientists adopt has a determining influence on the research they undertake and the interpretations of the scientific results and, hence, the message to society for deciding on quality and welfare issues (Fraser et al., 1997).

### **Material and methods**

This article reports the results from two different studies, an international survey to higher education teachers on their views on quality of OER, and a peer review process of an OER named “Farmland”. Farmland is a game about the production of food aiming at learning 10-12 years old children about animal welfare. It is available in 23 languages and has been produced by the European Commission. The quality of the game had not previously been examined, neither through peer review nor more inclusive methods.

The survey to higher education teachers was an investigation of differences in passion and altruism dependent on subject areas (animal welfare versus other animal or food production subjects) and how that can influence the views on quality assessment of OER and the power structures involved.

The peer review process was conducted by doctoral students in the subject of animal welfare, by the systematic use of a quality evaluation tool developed by Hays et al. (2005) and the results communicated with the European Commission. No approaches had been taken to apply methods for social ranking and recommendations. The discussions between peers were analyzed together with the final report to the European Commission.

### **Results**

The survey indicated that teachers in animal welfare wanted a quality approach based on peer-review in combination with user recommendations; other teachers wanted to combine peer review with assessment by an independent organisation. Teachers in animal welfare gave higher priority to student involvement and societal relevance than teachers in other subject areas. Animal welfare teachers correspondingly wanted to give students more agency since they found it more engaging and did not find it a quality problem to involve students in the creation of OER.

The peer review clearly indicated that the creators of Farmland had a definition of animal welfare and a view on animal welfare which did not correspond to the underlying values of the peer reviewers. “We believe that there is a need for explaining what good animal welfare is according to Farmland (and the Commission). Is the EU minimum legislation a good welfare level or is an animal-welfare-friendly way higher than the [legislated] EU minimum level?”.

## **Peer Review of OER is Not Comprehensive – Power and Passion Call for Other Solutions**

*Anne Algers, Magnus Ljung*

“In the introduction to the game it states that; ‘In the henhouse you’ll see that a fit and healthy hen lays more eggs than an uncared for hen’. These are of course important factors for hen’s welfare but we believe that it is important to teach the children that health and welfare is not synonyms. An animal can be in good physical health but at the same time experience poor welfare (FAWC, 2009)”.

The peers argued that the authority is not clearly stated and “a reference list can function both as a way of giving the page ‘authority’ and as a list for further information about animal welfare”. The OER was stereotyped and had a sexist undertone, and animal welfare was not discussed in broader contexts such as democracy and sustainability, which is expected to have the potential to open up the minds of the users.

The OER was not found to be inter-cultural. Visually, it reflected a Northern European tradition but some of the procedures described were not permitted in every Northern European country. Farmland had errors, it withheld information, it did not take into consideration the latest scientific evidence, and it was in some situations based on sensory conflicts.

Farmland did not uncover the different stakeholder perspectives on animal welfare, “it had a farmer’s perspective but might have higher impact if starting from a consumer perspective”. “We are lacking a focus on how consumers can influence the welfare of animals depending on consumers’ choice”. “One of the most efficient ways to improve animal welfare for a non-farmer is to be an aware and knowledgeable consumer”. The learning objectives were not clearly stated and the OER was not based on constructive alignment. “We miss a statement about why it is important for children to learn about animal welfare. Understanding the relevance of purposes and learning objectives will probably motivate the children to learn more”. “It would be good to make sure that the informational text mirrors the goals of Farmland; describe the hen’s life cycle, describe the hens’ needs and natural behaviour and why different resources are important, additionally give more information about egg as food”. “The idea of the game is to work quickly, which contradicts with an animal-friendly handling, although the header is: Here you have a chance to try rearing farm animals in an animal-welfare-friendly way”.

Farmland was not adapted to the target group (the amount of written text with small and grey font and the absence of film clips or speaker voice was not comprehensive for children) and performance assessment and feedback was inadequate. It was based on a multimodal approach, “however there should be strong connection between the 3 digital learning module outcomes, so that the user is learning the same thing from the texts or playing the game, [or the PowerPoint about the life of the specific animal]”. “Different farming systems are described, but too few pictures are showing the reality. We believe that it is actually hard for consumers [and children] to understand how modern animal husbandry systems of today look like”.

Hence, the criticism had factual, contextual and educational dimensions. The technological dimensions, however, were good; “it is easy to navigate on the pages, it is user-friendly and very easy to install on any computer”.

## **Discussion**

The fourth generation activity theory is about expansive learning, and builds on the idea that there are inner contradictions within the learners’ activity system and that knowledge creation transcends the context given, and is therefore found to be a useful framework for analysing the peer review process (Engeström, 2008). Engeström also asks the question, “What makes people strive for something beyond the immediately obvious goal or situation?” (Engeström 1995, p.441) and he later adds an agency layer, that reflects the individual intentions and breaks away pre-existing patterns of activity (Engeström, 2011).

Activity theory has illuminated important aspects of the objects of desire in collaborative activities of scientific practices (Nardi, 2005). In a collective activity system many actors and interests are involved and by separating motive and object it become clear that different motives can lead to the same object and activity (ibid). In collaborative systems negotiations and collective reflection are resulting in a collective object, but these activities are guided by human agency and passion (ibid).

Teachers in animal welfare have passionately held motives – objects of desire – since many see themselves as advocates for animals as a vulnerable group and want to influence the society through developing new scientific results and feeding the legislative authorities with evidence (Broom, 2009) and as participants in the societal debate. The peer review indicated that when the creators are not transparent with their values and, in this case their animal welfare definition, the risk is indoctrination. The reviewers criticised the uncertainty of the authority behind the OER but we argue that higher education does not have the authority to be the only assessor of quality of OER in the future, since the peer reviewers also have agency, which will affect their assessment.

At least three different motives in animal welfare have been identified; all that matters is that animals function well, are healthy and productive (McGlone, 1993), animals should be allowed to live a natural life and perform its natural behaviour (Kiley-Worthington, 1989), and animals’ feelings and emotions are important for animal welfare (Duncan, 1996). Scientists advocating restrictive conceptions of animal welfare sometimes propose corresponding restrictions on the scope of animal welfare. Thus, McGlone (1993) suggested that behavioural research is not necessary to understand animal welfare, Kiley-Worthington (1989) proposed that research on animals’ environmental preferences is not needed, and Duncan (1996) suggested that since it is the feelings of animals’ which govern its welfare, feelings should be measured in order to assess animal welfare (Fraser et al., 1997).

Thus, the positions taken by scientists are neither right or wrong, the disagreements are related to value-laden presuppositions about what is important for animal welfare; the danger

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is that researchers through their power determine what is to be researched, what type of research to undertake and thereby also provide society with their predetermined evidence (Fraser et al., 1997), which is affecting societal decisions on what we are allowed to do with our animals. As the results indicate, peer reviewers are gatekeepers having power to impose their values on other people, and since these experts' statements could not be supplemented by user evaluations they stood unchallenged. The survey indicated that teachers in animal welfare trusted students and users more than other teachers did and wanted quality instruments based on both peer review and user recommendations. We argue on this basis that peer review is not comprehensive but need to be supplemented with more collective instruments in order to be democratic.

OER is a new kind of learning approach which can be based on participatory enquiry and since openness is both the objectives and the instruments a peer review assessment of the artefact cannot be comprehensive. The design of the process should be able to challenge mental models by utilising pluralism and diversity and therefore it requires a complex mix of quality instruments (Camilleri et al., 2014) enabling users to be involved in the quality process. Atenas & Havemann (2013) suggest that evaluation of OER repositories partly can be based on an analysis of measurements of number of downloads of a single OER or social media sharings. Such quality instruments can in combination with peer review be a trustworthy evaluation because it embraces both accuracy and legitimacy.

Striving to share the same object between multiple activity systems complicates the issue of power and passion. Commercially-driven cooperative industries generally have a profit motive of interest, animal activist communities have an empathy motive of interest, and consumer communities may have other motives. Since animal welfare is a domain of relevance for various interest groups, collective activity systems are interacting and a shared object for animal welfare will influence their objects of desire, their activities, their negotiations and their shared object.

Kleine (2013) argues that in order to achieve sustainable development a move from an individual to a collective approach is necessary, involving i) accept limits of system earth, ii) overcome individualistic bias and iii) seek participatory and fair ways to negotiate limits. Peer review of OER is not comprehensive; participatory instruments are necessary for the evaluation of OER and ultimately for sustainable development, and the interaction between i) the network of users of OER and ii) the network in publishing industry and formal education, suggested by Camilleri et al. (2014) may form the future solution.

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## **A MOOC AVANT LA LETTRE: DAVID HARVEY'S LECTURES ON 'READING CAPITAL' AND WHAT DISTANCE EDUCATORS MAY GET FROM IT**

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### **Introduction: A MOOC *avant la lettre***

Since the beginning of the Great Recession in 2008 a number of commentators both in books (Eagleton, 2011; Reheis, 2011) and newspapers (Henwood et al., 2014) asked the question if Marx may have been right about capitalism. Doug Henwood in his contribution to the NYT debate has held that the recent development of capitalism had led to “A Return to a World Marx Would Have Known” (Henwood, 2014). More generally, escalating inequality has attracted general attention and turned Thomas Piketty’s book *Le capital au XXI siècle* into a bestseller which gave its author celebrity status (Piketty, 2013).

However, while serious discussion of Marx has recently gained a certain level of respectability, the question remains, what all this has to do with education in general and distance education in particular? The argument advanced here is the following: The discourse on education (and, in its wake, the one on distance education) sees education as a *panacea* for central social ills. The mainstream discourse is based on the assumption that the modern knowledge-based economy needs high skilled labour which the education sector persistently fails to provide. At the heart of the problem, therefore, is a ‘skills gap’ which can only be addressed by educational reform. Once this gap is finally closed, productivity levels will increase and poverty will be eradicated.

We are still waiting for this to happen. Recent experience with the ‘Great Recession’ in the heartland of capitalism (the US) has dashed such hopes. Hence the *research question* asked in this paper is: To which extent does reading Marx free educators, and distance educators in particular, from the neoliberal straightjacket in which much of the professional discourse is trapped? The *research methodology* for addressing this question is re-reading Marx, guided by what can be described as a *MOOC avant la lettre*, i.e. the lectures on reading Marx’s *Capital* by David Harvey (<http://davidharvey.org/reading-capital/>). To have Harvey as a guide to Marx has two distinctive advantages: Harvey has taught *Capital* for the last forty years to very different audiences, and this experience is reflected in the clarity of his presentation; possibly

even more important is that he applied insights from reading Marx effectively in his profession as a geographer<sup>1</sup>. This is what I also hope to achieve to some modest extent.

In the second part of this paper I give a succinct account on some core concepts in *Capital* which explain why from the Marxian vantage point the persistence of poverty, inequality and unemployment comes to no surprise. We will proceed in three steps: The first two are labelled 'riddles' (here using Jameson, 2011) since they pose the questions (i) how surplus value arises from the exchange of equivalents, and (ii) why, when it is only living labour which can create value, capitalism leaves so many people unemployed; the second riddle especially leads to a discussion of the role of technology in Marx's framework.

In the third part we look at the education discourse and the idea that education is a *panacea* for all major social problems including poverty, inequality and unemployment. The usual 'skills gaps' argument is rooted in 'human capital theory' (HCT). We will argue that burdening the education discourse with challenges education cannot solve leads to a merry-go-round of futile educational reforms ending in a blame game, where learners are blamed for not investing enough in their education or/and making wrong educational choices, and governments for not setting the proper incentives (Wedekind, 2014; Vally & Motala, 2014b; 2014c).

In the fourth part we narrow the focus on distance education bringing Marx's perspective on education together with what he tells us about technology; distance education after all is (pace Peters, 1983) the 'technologically most mediated form of education'.

## **The process of capital**

In order to find out if Marx's *Capital* has some bearing on the understanding of education and distance education I need to summarize what Marx is saying. For the purpose of the argument here I treat Marx's framework as a sort of axiomatic system, the truth of which cannot be discussed here. What we want to explore is the heuristic power of the approach.

For Marx, capital is a process, not a thing. The process can be described in quite simple terms. The capitalist has (or borrows) money, buys machines and raw material, and engages labourers to work with the machines and the material to produce useful things (commodities) which can be sold on the market. If all works well, the capitalist can sell them with a profit which allows him to start all over again at an expanded level (cf. below, Figure 1). Marx calls this process, where the capitalist invests money and, in the end, gets more money in return, the accumulation of capital.

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<sup>1</sup> For historically interested visitors of Paris, Harvey's book on Paris is a must! (Harvey, 2003)

### ***Riddle 1: The emergence of surplus value***

All this seems straightforward so far. However, in this simple narrative a little riddle is concealed with puzzled economists for some time: How could it be that, in a process of exchanging equivalent values, a surplus (or profit) can be made? (Values, for Marx, are compared on the basis of the 'average socially necessary labour time' needed for their production. Note that Marx is little interested in prices which tend to oscillate around the value depending on supply and demand. For his discussion Marx assumes an equilibrium situation, such that differences in supply and demand do not explain anything.)

In order to solve the riddle of how an exchange of equivalent values is compatible with the emergence of surplus value, Marx spotted one commodity on the market with a peculiar quality, which provided the clue for solving the riddle. It is the commodity of labour power. *Labour power has the peculiar quality that it can produce more value than its costs* (in term of wages): "When you work for \$10 or \$20 an hour for an employer you know, even if you never studied economics, that the only reason that employer will ever pay you \$10 or \$20 an hour is if you produce more than \$10 or \$20 an hour worth of stuff for that employer to sell. (Wolff, 2012) This solves the riddle since the buying and selling of labour power fully complies with the law of exchange of equivalents as the workers receive the full value of their labour power, which is equivalent to the bundle of commodities needed to reproduce it. But at the same time they produce more in value than they cost. Here lies Marx's genuine contribution to the *labour theory of value* which was at the time considered part of mainstream economics. Popper, otherwise a fierce critic of Marx, concedes this was an excellent theoretical move: "By means of a further simple but excellent idea, he [Marx] was able to show that the theory of surplus value is not only consistent with the labour theory of value but that it is a consequence of it." (Popper, 1958, p.211, translation TH) Popper then went on to dismiss the whole concept of value as irrelevant, but in this he missed Marx's intention. The concept was not advanced to understand price fluctuations and the like better, but as a contribution to class analysis. As such it contained, indeed, much 'red meat for agitation'. While Marx recognized that the exchange of labour power for wage was an exchange of equivalents, the fact remained that the arrangement allowed the capitalist to appropriate the whole surplus value which gave rise to the concept of 'exploitation'. The fact that in capitalism exploitation was fully compatible with 'fair' exchange (exchange of equivalents) seems to add insult to injury<sup>2</sup>. However, it is easy to see that in a model where workers simply get the means to reproduce their labour power while the fruit of their labour is lawfully due to the employer, escalating inequalities are unsurprising.

Capital has a number of strategies for accumulating surplus value. The first is by mopping up all the available labour; the second is by lengthening the working day. Marx, often relying on

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<sup>2</sup> While being aware of the post-hoc-propter-hoc fallacy, it is, however, worth noting that shortly after *Capital* was published in 1867, there was a paradigm shift in economics away from the labour theory of value (the Smith/Ricardo/Marx line) to the subjective theory of value (Jevons, Menger, 1871 Walras, 1874, Marshal, 1890). In the conceptual apparatus of this new neoclassical paradigm, questions about exploitation and crises do not emerge (Heim, 2013).

the reports of Her Majesty's factory inspectors, describes vividly the struggle around the length of the working day, and considering the reports from the sweatshops in China or India, Henwood's observation, cited above, that neoliberalism produced a world Marx would have recognised, hits the point.

### **Riddle 2: Unemployment**

There is, however, another riddle which derives from the contradiction between high levels of unemployment and Marx's axiomatic insistence that only living labour can produce value. Would not it be logical to expect that the 'animated monster' (Marx, *Capital* Vol. I.) of capital accumulation would suck in all living labour in the quest of creating surplus value?

Marx's explanation is the following: Besides the two above mentioned strategies (sucking up more labour, and the extension of the working day), there is another strategy to produce surplus value: The use of machinery (technology). Note that in Marx's conceptual framework machines represent 'dead labour'; they cannot create, but only *transfer* value. However, they can play a role in creating surplus value. They do this by increasing labour productivity, i.e. by reducing the proportion of the working day required to produce the value equivalent of the wage, thus increasing the proportion of the working day for the production of surplus value.

The use of machinery (technology) has a second function: It allows capital to discipline labour. It allows producing a sufficiently large 'surplus population of workers' to keep the wage demands of labour in check. The purpose of capital accumulation is hence always a double one: to *produce* surplus value and to *reproduce* the social relations of capitalism (class relations).

### **Technology: Moral depreciation**

The use of technology in the process of capital accumulation provides an explanation for the *extraordinary pace of technological innovation under capitalism*. Marx discusses this under the heading of 'moral depreciation' (Marx, Vol. I., p.529). The innovator can expect extra profits from being able to produce below the 'average socially necessary labour time' which is the measure of value. If I have a sewing machine and others sew by hand, I produce my goods more cheaply (i.e. below the 'average socially necessary labour time') than my competitors, which means that my profit margin is greater. This is true as long the new technology is not generalized (i.e. all use sewing machines). Once this has happened, no extra profits accrue due to the technology. The socially necessary labour time to produce shirts and trousers, and that means their value, simply drops.

It is this time window which allows the harvesting the windfall profits that capitalists seek to exploit. Machines are replaced even before they are fully depreciated in order to not fall behind. On the other hand innovators generally try to prolong their monopoly position, using by patents and secrecy to keep this time window as large as possible.

### **Crises, blockage points**

The process of capital has been summarized above. Harvey (2010) adds a discussion of possible blockage points which may bring the process of capital to a halt and so produce a crisis. In Harvey's reading Marx takes the Smith/Ricardo tradition of political economy to show that this 'model' leads to other consequences than its authors predicted (rather than raising welfare across the board it leads to an accumulation of wealth at one pole and poverty at the other). Only rarely in *Capital* does Marx descend into the realm of 'particularities' (history). In the chapter on primitive accumulation (Marx, Vol. I., Ch. 8.) he makes an exception and launches into an extensive discussion about the historical origins of initial capital. Marx seems largely to consign the initial lawlessness of primitive capital accumulation to the prehistory of capitalism. Harvey argues that this process is much more endemic to capitalism and introduces the term 'accumulation by dispossession' which, for instance, is part of many large scale privatisation processes. Today, getting the often large sums of initial capital is greatly facilitated by developed credit systems but crises, where the needed *credit* is not available, are common.

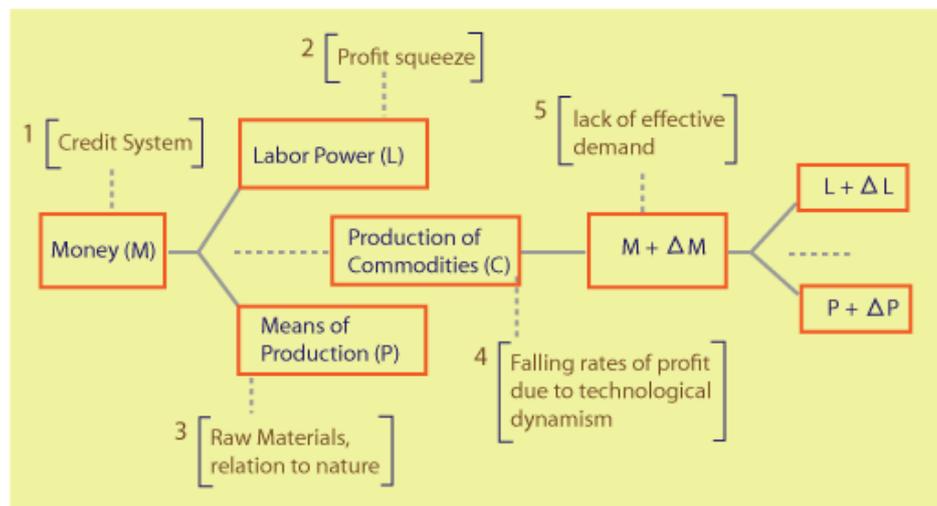


Figure 1. The process of capital (based on, Harvey, 2010)

Notes: M denotes the initial capital while  $M+\Delta M$  includes the surplus; similarly  $L+\Delta L$  indicates that the expanded capital may require more labour and more machinery ( $P+\Delta P$ ).

The many conflicts about *raw materials* signal that their availability presents a potential blockage point for the smooth flow of capital accumulation. The role of *labour* conflicts leading to crises of profitability is well known and can be seen as a key factor in the emergence of the neoliberal project in the seventies. More controversial is the 'law (or tendency) of *falling rates of profits*' which under certain conditions can be presented as a mathematical truism, but at the moment is belied by the presently high profit rates. That the appropriation of the whole surplus by capitalists keep wages low, and often contribute to *crises of effective demand*, is also well known. Keynes tried to address this.

Overall, the analysis suggests that capital leads to economic growth which tends to be unequally distributed since wages tend to hover around the poverty line, while most of the surplus society produces can be found at the other social pole. In addition, the coercive laws of competition lead to monopolies: points in case are the automobile and pharmaceutical industries. Finally, the process is crisis prone: the many potential blockage points produce frequently and severe disruptions. As a result inequality, poverty and unemployment must be regarded as inherent features in the process of capital accumulation.

## **Deconstructing the education panacea**

Panacea is the 'goddess of universal remedy' and it seems that, for some time, education has been seen as such a universal remedy. In the remaining part of this paper we look at the implications of the process of capital in which education is embedded, and ask to what extent Marx's analysis of this process allows a reassessment of the role education can play. We then narrow the focus to distance education. As 'the most technologically mediated form of education' (pace Peters, 1983) distance education can be re-visited against the backdrop of Marx's analysis of technology.

## ***HCT and the 'skills gaps' discourse***

Education is expected to address major social ills: poverty, unemployment, and inequality. Marx's analysis of capital in motion, the various blockage points triggering crises, and all this happening completely without any reference to education, suggests that the three social ills hardly can be treated as dependent on education. Note that generally unemployment is seen as the key variable among the three (poverty is seen as being due to unemployment, and inequality is generally seen as a minor ill, brushed aside as being borne out of envy). According to Marx's analysis full employment is certainly not the purpose of capital. On the contrary the use of technology enables two equally important functions of capital to be achieved: first, the production of *surplus value* by increasing productivity, and second, the creation of a *surplus population* of unemployed workers, which helps to discipline worker demands. How powerful the lever of technology is for creating a surplus population of workers has been recently documented by an Oxford Martin School report showing that nearly half of US jobs are at risk due to computerization (Frey & Osborne, 2013).

The world looks different from a human capital theory (HCT) perspective. Based on the observation that on average the educated earn more, HCT explains this by the fact that education forms skills which make the worker more productive, thus enabling capitalists to increase their profits. Because of the 'added value' the capitalist receives from skilled labour, the educated employee receives a bigger cut from the surplus value produced. It is even declared that everybody is a capitalist since all of us can invest in our talents thus increasing our value for capitalists and boosting the rate of returns to education which we enjoy by achieving higher lifetime earnings and a lower risk of unemployment (Schultz, 1961). Arguments linking investment in education directly to economic growth are, however,

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contested: "It has become commonplace to argue something like a 1% increase in education quality will get you a 1.3% increase in GDP. – This is simply absurd." (Klees, 2013)<sup>3</sup>

HCT has been challenged by a variety of rival theories such as the *Screening Theory* or Thurow's *Job Competition Model*. While in HCT the productivity resides in the qualities of the individual (the skills acquired through education or natural talent) "the positional goods perspective [especially in Thurow's job competition model, TH] sees productivity as primarily determined by jobs, and individual earnings depend on the job they acquire, and not personal characteristics" (Allais & Nathan, 2014, p.110) That a machine operator is more productive than a manual worker depends on the machine (his job) rather than on his or her personal character traits.

While HCT emerged in the seventies as the major theory of economics of education, its' roots go back to Adam Smith. Marx refers to contemporary economists, who also defined labour-power as capital, since selling it yields the worker continuous revenue (a reasoning akin to HCT), but he rejects the argument:

*Labour-power is indeed his property (ever self-renewing, reproductive), not his capital. It is the only commodity which he can and must sell continually in order to live, and which acts as capital (variable) only in the hands of the buyer, the capitalist. The fact that a man is continually compelled to sell his labour-power, i.e., himself, to another man proves, according to those economists, that he is a capitalist, because he constantly has – commodities (himself) for sale." (Capital II; Chapter XXII, p. 268; emphasis added)*

For Marx the value of skilled labour is determined (as is the value of all labour) by the socially necessary labour time required to produce it. The capitalist is therefore interested to bringing down the cost of producing skilled labour or, at least, in externalizing these costs by ensuring that they are borne by the state or the individual learner. HCT played some part in this process, especially with respect to Higher Education (HE): The returns to HE are claimed to be sufficiently large to legitimize the requirement that learners should take out a loan to finance their studies. This devolves the cost and risks of educational investment to the learner. As a result the debt burden of US students has surpassed the one trillion dollar benchmark (Hülsmann, 2013). In the UK a recent report indicates that the average student will now leave university with more than £44,000 worth of debt which with interest will amount to a total debt of just under £67,000, and that a middle-earning graduate will still owe about £39,000 at today's prices by the age of 40, and £32,000 by 50 (Adams, 2014; Crawford & Jin, 2014)<sup>4</sup>.

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<sup>3</sup> Point in case: "We find that a one-year increase in the tertiary education stock would raise the long-run steady-state level of African GDP per capita due to factor inputs by 12.2%" (Bloom et al., 2006) While not labelling such finding 'simply absurd', I would rather point out that such findings are highly dependent on the applicability of the assumptions made in the model.

<sup>4</sup> Hence it can be argued "that the RORE is not high enough to justify the debt burden carried by graduates. If the additional earnings are, as stated, £100,000 over the earning life of an individual (on average), and the

The discovery of substantial rates of return to those prepared to invest in education as a business venture attracted private investors and led to setting up education as an industry in its own rights. Since education is 'the only game in town' allowing upward social mobility, learners are forced into an educational arms race where they try to out-compete others by adding yet another educational credential to their portfolio. Another aspect fuels the additional demand for post-secondary education: the internal logic of educational expansion. Following the generalization of primary school education, the secondary school was expanded, leading to large numbers of students *ante portas* of HE. All this development was largely independent of the development of labour market demand. Paradoxically, it is the very inability of the labour market to absorb the increasingly educated which means that the education system itself increasingly needs to absorb their own graduates in order to sustain its own growth<sup>5</sup> – not to prepare them for a job but to keep them at least for a while out of the labour market:

*Collins (1979; 2013) suggests that educational expansion is not driven by technological requirements of work, but rather by the inability of labour markets to absorb labour. He argues that rising demands for education absorbs increasingly surplus labour by keeping more people out of the labour force; he suggests in places where the welfare state is unpopular for ideological reasons, belief in the importance of education supports a hidden welfare state. (Collins as cited in Allais & Nathan, 2014, p.112)*

The idea of the lifelong learner who re-invests what he/she has in a further round of education or training conjures the image of the learner shuttling from casual job slots in the labour market back to the education system to keep himself/herself ready for the next job in the labour market<sup>6</sup>. The rising levels of qualification offered by prospective employees, together with the independent development of a labour market that very much depends on exogenous factors that are more or less independent of the supply of educated labour, leads to what Brown et al. (2011) call a 'Dutch Auction', where a limited number of well-remunerated jobs are auctioned to a surplus population of educated labour.

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average period of employment post-graduation is a (conservative) 40 years, then the RORE is just £2500 per year. Better to moonlight in a different job!" – I owe this observation, among others, to Greville Rumble who also took the trouble of editing my English.

<sup>5</sup> "In 2008, [VUT Vaal University of Technology, TH] conducted research on graduate employment based on a representative sample of 1117 graduates and reported that 35%, 26%, 73% and 65% of those who graduated in Applied and Computer Science, Engineering Sciences, Management Sciences and Humanities were unemployed." (Hlatshwayo, 2014, p.143)

<sup>6</sup> Of course, it also keeps employability up – the decay of knowledge, with the half-life of knowledge in some fields now down to months (12-18) rather than years, means that retraining and updating IS part of the job.

## **Distance education**

Distance education is about *access, efficiency and flexibility*. Let us continue the bleak reading of education that we have been exploring here and apply it to distance education. Widening *access* helps to expand education thus creating the necessary surplus population of educated people which then leads to the above mentioned 'Dutch Auction', which keeps labour costs in check. *Efficiency* reduces the production costs of educated labour, which is also very welcome both to the employer, since it brings down labour costs, and the increasing privatised providers of education, who can thus increase his profits. This is done by a combined set of measures: 'capital for labour substitution' and 'labour for labour substitution' (i.e. the substitution of cheap labour for more expensive labour). This two pronged strategy determines the specific cost structure of distance education: high upfront development costs and low variable cost per student (Hülsmann, 2004). This brings down average costs per student when rolling out the system (scale economies). Bringing down the 'socially necessary labour time' for producing education brings down the costs to the employer. (Remember, the key illusion of HCT was the conclusion that the higher productivity attained by educated workers/professionals would entitle them to a cut of the value they helped to produce: following Marx, all labour, including educated labour, is remunerated according to its value, i.e. the socially necessary labour time to reproduce it. They will be remunerated at a higher rate than an unskilled labourer as long as the production costs of the additional skills are higher. But they are not, any more than any other worker, entitled to an additional cut of the surplus value. That goes to the capitalist.)

The third characteristic of distance education is *flexibility*. This allows the learner to study part-time. This is much welcomed. First of all, it helps externalize the costs of skills formation. The working learners themselves pay for their education. Again a passage, this time from Vol. III. of *Capital* is instructive:

*The commercial worker produces no surplus-value directly. But the price of his labour is determined by the value of his labour-power, hence by its costs of production, while the application of this labour-power, its exertion, expenditure of energy, and wear and tear, is as in the case of every other wage-labourer by no means limited by its value. His wage, therefore, is not necessarily proportionate to the mass of profit which he helps the capitalist to realise. What he costs the capitalist and what he brings in for him, are two different things. He creates no direct surplus-value, but adds to the capitalist's income by helping him to reduce the cost of realising surplus-value, inasmuch as he performs partly unpaid labour. The commercial worker, in the strict sense of the term, belongs to the better-paid class of wage-workers – to those whose labour is classed as skilled and stands above average labour. Yet the wage tends to fall, even in relation to average labour, with the advance of the capitalist mode of production. This is due partly to the division of labour in the office, implying a one-sided development of the labour capacity, the cost of*

*which does not fall entirely on the capitalist, since the labourer's skill develops by itself through the exercise of his function, and all the more rapidly as division of labour makes it more one-sided. Secondly, because the necessary training, knowledge of commercial practices, languages, etc., is more and more rapidly, easily, universally and cheaply reproduced with the progress of science and public education the more the capitalist mode of production directs teaching methods, etc., towards practical purposes. The universality of public education enables capitalists to recruit such labourers from classes that formerly had no access to such trades and were accustomed to a lower standard of living. Moreover, this increases supply, and hence competition. With few exceptions, the labour-power of these people is therefore devaluated with the progress of capitalist production. Their wage falls, while their labour capacity increases. The capitalist increases the number of these labourers whenever he has more value and profits to realise. The increase of this labour is always a result, never a cause of more surplus-value. (Capital III, Chapter XXVII, p. 201, emphasis added)*

The last part of the quotation in particular gives short thrift to the belief that employment would expand as a function of the supply of educated labour.

In addition distance education can be seen as helping open up education to market competition. Silver (2003), who sees education as one of the lead industries of the 21<sup>st</sup> century, conceptualized the process of capital as oscillating between *legitimacy crises* and *profitability crises*. For capital to escape a profitability squeeze it has at its disposition three 'fixes': the *technology fix* (e.g. automation), the *geographical fix* (e.g. relocation) and the *production line fix*. With respect to distance education especially the first two are relevant. The point of departure of Silver's discussion is that education is, more than other industries, shielded from market competition because it is not so prone to the use of technology. You cannot easily substitute the teacher by a machine. Education is also shielded against geographical fixes since you cannot relocate the school children. However, much of this has changed with the advent of distance education. Both, technological and geographical fixes, are on the agenda. The capital for labour substitution in distance education is a point in case. This is the basis of the cost-efficiency of mega-universities. Labour for labour substitution is rife in higher education and being pushed to extremes as educators begin to emphasise the importance of peer-teaching. Cross-border distance education shows the increasing possibilities of geographical fixes. Reaching out to learners on a global scale, as MOOCs do, is a point in case.

MOOCs are of particular interest here. They (especially xMOOCs) can be considered as 'distance education reloaded'. They seem to offer ivy-league education on a global scale for free. Assuming, rather hypothetically, that MOOCs really would be the magic wand that the skills gap discourse was looking for, and that one could indeed produce highly qualified labour on a global scale for free, what would this mean read against the conceptual framework Marx offered? For Marx the value of a commodity depends on the socially necessary labour

time to produce it. If MOOCs bring this figure down to zero, then the added-value of skilled workers also would drop to zero, which means that the returns to the added skills would vanish.

## **Conclusion**

Much of what we think and publish in distance education (and education) is embedded in a taken-for-granted framework about the working of the world. The mainstream perspective is optimistic and sees market capitalism and technology as eventually ironing out sharp inequalities, dismal poverty, and unemployment. The Great Recession, combining escalating inequalities with sharp increases of unemployment and persistent (relative) poverty in some of the traditional homelands of capitalism, dashed these hopes, at least for the near future.

The mainstream analysis of this dismal state of affair points to education as the solution. If only the skills gaps could be closed, the knowledge society would absorb all these educated people in well-paying jobs. As a consequence education is permanently reformed according to labour market requirements. The role of distance education in this context is widening access and increasing cost-efficiency.

Marx certainly offers a very distinct reading of this situation: The process of capital is inherently crisis prone; inequality, poverty and unemployment are intrinsic features of capitalism. Especially, unemployment is even a welcome feature insofar it keeps wage demands in check. Recourse to technology in times of full employment allows the calibration of employment at a level assuring profitability.

The labour theory of value suggests that the educated worker, like any other worker, is paid according to the cost of his/her reproduction and is no more than any other worker entitled to a cut of the value he/she produces. Expanding the supply of skilled workers and reducing the production costs of skills tends to bring down the 'graduate premium' and increase the risk of unemployment.

The possibly positive side-effect of this view is that it may free the educational discourse from challenges it cannot live up to. This may lead to labour market policies focusing more on the demand side and the structure of labour markets than on wrong-footed reforms towards a vocationalization even of higher education (in a sense which drives out any 'vocation'). This certainly leads to a gamut of different research questions than those of JIT modularized competence development for the increasingly fragmented job slots the labour market offers.

## Postscript

It could be asked if the reference to Marx is really necessary to make the case against the 'skills gaps' discourse? And, if Marx has to be brought in at all, why the reference to *the labour theory of value* has been dragged in when it has been discarded by many who are otherwise sympathetic to much of Marx's criticism of capitalism?

The reasons for neither avoiding Marx nor the labour theory of value are the following: First, it would show a simplistic understanding of scientific method to say about a theory that it has been 'proved wrong' (naïve falsificationism). The 'career of a theory' depends on both the extent to which the conceptual apparatus of the theory as compared to rival theories shows a better 'positive heuristics' (Lakatos, 1970), and the extent to which it is compatible with the prevailing hegemonic ideas in society (cf. Gramsci's concept of hegemony). Both reasons are likely to have contributed to the paradigm switch discarding the Smith/Ricardo/Marx line of research in economics. Marginalism (Menger/Walras/Jevons) came with a different research programme which coincidentally had the advantage that uncomfortable questions emerging from the labour theory of value (e.g. exploitation, crises) would simply disappear. But these questions need to be back on the agenda, and since they emerge most clearly from Marx's labour theory of value, I wanted to restate them (albeit, admittedly, with some trepidation). I found myself encouraged by Wolff and Resnick's 'Contending economic theories' (Wolff & Resnick, 2012), where they argue that Marx's approach had other intentions than those of the rival theories, and so needs to be evaluated accordingly. Marginalism is much interested in consumer choices, and price and demand fluctuations. Marx is not interested in prices determined by the 'particularities' of supply and demand fluctuations. Marx assumes, for the purpose of his argument, that supply and demand are in equilibrium, such that prices reflect values, measured in labour time. This method of accounting, predicated on the assumption that it is only living labour which produces value, makes class relations visible.

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## ACHIEVING IMPROVED QUALITY AND VALIDITY: REFRAMING RESEARCH AND EVALUATION OF LEARNING TECHNOLOGIES

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### Introduction

In recent years open and distance education (ODE) has increasingly been equated with digital learning technologies. Through the use of technology, universities in many countries now offer aspects of ODE, whether they are dedicated ODE institutions or teach primarily face-to-face. While the investment in technology has been considerable, findings from research and evaluation studies of learning technologies have had little impact on implementation decisions and teaching practices. Has research contributed to building a body of evidence that can inform and provide a firm foundation for subsequent developments in academic practice? Is evidence being generated and reported that can inform the practices of university teachers and students? Innovation and change should be evidence-informed and we need to ensure that the research and evaluation of learning technology produces findings that can inform other practitioners and policy-makers.

There are concerns about what types of evidence are considered during any implementation decisions (Price & Kirkwood, 2014), misgivings have also been expressed about the lack of a well-established body of evidence and about the quality and validity of many research and evaluation studies. This area of scholarship has been described (Selwyn, 2012) as “notoriously sloppy” and “brimming over with lazily executed ‘investigations’ and standalone case studies, while also tolerating some highly questionable thinking” (p.213). Many improvements could be made when research and evaluation studies relating to technology and education are conducted.

We have reviewed research literature, reports and case studies relating to learning technology innovations and identified many problems with the ways in which studies were conceived and conducted. Consequently, it is difficult to generalise any findings about effectiveness. We identified issues relating to assumptions and beliefs underpinning research studies and the approaches used to investigate the impact of technologies (Kirkwood & Price, 2013a). Frequently, there was a lack of clarity about the nature of the *enhancement* that technology was intended to bring about and what impact technology would have upon the student learning experience (Kirkwood & Price, 2014). Furthermore, relatively few published accounts of such innovations at university level exhibited a scholarly approach to teaching. Frequently,

interventions appear to be technology-driven rather than being undertaken in response to identified teaching and/or learning concerns (Kirkwood & Price, 2013b).

Here we examine some implications of the shortcomings we identified in published studies. We then suggest ways of avoiding these limitations through taking a more rigorous approach to conceptualising, designing, conducting and reporting research and evaluation studies relating to learning technologies.

### **How ‘fit for purpose’ are the research methods utilised?**

Research methods are not value-free or neutral: they reflect epistemological positions that determine the scope of inquiries and findings. In other words, there are assumptions and limitations associated with all research methods and approaches and these are often *implicit* or *unstated*. In published research and evaluation studies of the use of technologies for education we have identified:

- A lack of clarity and specificity about what outcomes were expected to be achieved and, therefore, what the focus of the research should have been;
- Narrow or inappropriate conceptions of what constitutes ‘scientific’ experimentation;
- Poorly conducted ‘scientific’ experimentation;
- Insufficient attention to the underlying assumptions and models associated with any method of enquiry;
- Unwarranted conclusions being drawn from research findings, often based upon inappropriate expectations.

Before discussing these shortcomings further we explore briefly what we mean by ‘rigour’ in such research.

### **What determines ‘rigour’ in educational research?**

We are concerned that much of the published research on learning technologies has been undertaken without a rigorous approach. On the other hand, we are also troubled by the claims made by some researchers that only a highly constrained ‘scientific’ approach has any validity. A scientific enquiry involves the testing of hypotheses about *why* and/or *how* things happen. It is as much about framing the right questions as it is about adopting any particular approach or methodology. Testing is carried out by carefully collecting evidence that is both appropriate and sufficient to demonstrate whether or not the expected consequences of the hypothesis have happened. If not, the hypothesis must be rejected and a revised hypothesis subjected to scrutiny in a similar manner.

In recent years there has been considerable debate (particularly in the USA) about the extent to which educational research should be more experimental, ‘evidence-based’ and be directed towards informing policy-makers about ‘what works’. Ostensibly, the linking of research and policy-making for practice might seem fairly innocuous. However, it is necessary to examine

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the assumptions and theoretical positions that underlie the various claims in order to understand the nature of the controversy and debate.

Some people claim that generalisable results can only be obtained by the adoption of positivist experimental methods and approaches (Cook, 2002; Slavin, 2002; 2003; Torgerson & Torgerson, 2001). Randomised controlled experimentation, often found in medical research, is proposed as the ideal to be emulated in educational research. It is claimed that research on the use of technology for teaching and learning should involve tightly controlled ‘comparative studies’ or other forms of experiment. A cumulative synthesis of results from many such studies can be developed through ‘systematic reviews’ and ‘meta analyses’ (e.g. Tamim et al., 2011). All require the adoption of a strict experimental approach, the use of quantitative data and statistical analysis techniques. They also relate only to certain types of educational innovation or intervention. Consequently, this narrow and prescriptive view of what constitutes ‘scientific’ research excludes consideration of any studies that do not meet strict criteria for inclusion. It also reflects just one view of what constitutes education, a highly contested concept.

Many educators and researchers dispute that position for both practical and epistemological reasons (Biesta, 2007; Clegg, 2005; Howe, 2009; Reeves, 2011; Rowbottom & Aiston, 2006; Scriven, 2008; Simons, 2003). We cannot examine those criticisms in detail, but there are many problems to be explored by those aspiring to undertake rigorous experimental research in education. Questions should be asked, such as:

- How similar are the educational and medical contexts – Is it appropriate to equate teaching and learning processes with the treatment of medical conditions?
- How feasible and ethical is it to conduct randomised experiments within education contexts, particularly when (for example at university level) the number of participants tends to be fairly low?
- Exactly what part of the educational process is being investigated when strictly controlled experiments are conducted?

In respect of research on the use of learning technologies there are further contested aspects. For example, the applicability of the much-used ‘comparative study’ method, which so often leads to ‘no significant difference’ being the reported outcome. Can that experimental method be an appropriate way to assess innovations aimed at transforming students’ learning (rather than maintaining the *status quo* in all respects other than the medium used)? (Kirkwood, 2013) Seeking a suitably rigorous ‘scientific’ approach, many researchers concentrate their attention on the wrong variables (e.g. instructional delivery modes) rather than on meaningful pedagogical dimensions (Reeves, 2011)[14]. Other research methods and approaches can be suitably rigorous (2011), without invoking narrow experimentation and technological determinism (Oliver, 2011).

## **Improving quality and validity**

Better conceptualisation of the issues underpinning any study (i.e. the goals, aims and rationale of an innovation; the underlying assumptions about ‘teaching’, ‘learning’ and ‘enhancement’) are essential to improve the quality and validity of research. A better understanding will inform and influence the research approach adopted and the data collection methods involved. It will also clarify what interpretations of the findings are appropriate (or not) at the reporting stage. We suggest the following steps to improve the quality and validity of research.

### ***Ascertain the aims and rationale of the e-Learning project***

Why was a technology innovation initiated and implemented? What goals was it trying to achieve? These need to be understood before deciding on the most appropriate research approach and methods. Determine *what* precise form of enhancement is sought from this application of learning technology. For example, is the desired enhancement primarily concerned with issues such as (a) increasing technology use, (b) catering for increased student numbers, (c) improving the circumstances or environment in which educational activities are undertaken, (d) improving teaching practices, or (e) improving – quantitatively and/or qualitatively – student learning outcomes? Researchers must consider *how* any enhancement will be achieved and demonstrated (e.g. greater use, increased time on task, improved student satisfaction with teaching, quantitative and/or qualitative improvements in learning). If the intended enhancement involves ‘improvements in learning’ how are these conceptualised and how will they be operationalised and demonstrated? These are discussed further in subsequent sections.

### ***Determine the pedagogic purpose of the technology project***

A recent critical review of published research and evaluation studies of actual technology interventions (Kirkwood & Price, 2014)[4] found that the primary purpose of each project could be assigned to one of three categories:

- Replicating existing teaching practices;
- Supplementing existing teaching;
- Transforming teaching and/or learning processes and outcomes.

Occasionally the stated outcomes expected of projects were inappropriate for the type of intervention being made. For example, projects that simply replicated existing teaching had unwarranted expectations about the transformation of student *learning*. Simply changing the delivery method does not alter the pedagogic function to any significant extent. A lecture remains a lecture (i.e. a primarily transmissive pedagogic method) whether it is delivered in a lecture-room, as a web-cast to be accessed synchronously and/or asynchronously or as an audio or video podcast accessed ‘on demand’.

***Recognise that technologies and tools can be used for multiple educational purposes***

Researchers and practitioners must recognise that most technologies/tools (such as blogs, forums, podcasts and wikis) are not associated with just a single 'ideal' role, but can function in a variety of ways for many different educational purposes. The manner in which a technology is used for a particular type of learning activity and anticipated outcomes will reflect the teacher's epistemology and approach to teaching and learning (e.g. transmissive, constructivist, collaborative, etc.). Students' use of a technology in that specific context can differ from that experienced in other contextual circumstances. It is insufficient to describe a technology innovation as being about students 'using a wiki' or 'using a discussion forum'. The educational *purpose* and *mode of deployment* must also be specified and explored.

***Determine what benefits are expected to be achieved from a technology intervention and for whom***

Try to determine the origins of any learning technology project being investigated. Why was it considered necessary? How was the pre-existing situation to be improved by the use of technology? It is essential to clarify not only the nature of the benefit(s) expected from any project, but also the anticipated beneficiaries. For example, the use of pre-prepared and quality-checked materials and resources can benefit learners, teachers and institutional managers by ensuring that greater consistency and standardisation is achieved. Some other technology-based interventions seek novel outcomes, their primary aim being to enable learners to acquire and develop knowledge and skills that are difficult to achieve by other means. Research and evaluation studies of technology projects should ensure that (a) the full range of relevant benefits and beneficiaries is considered and (b) the methods and approaches used are appropriate. It would be insufficient, for example, for measures of satisfaction to be used to determine whether students' learning had been improved (quantitatively or qualitatively) by a particular intervention.

***If some form of learning or teaching enhancement is expected, how is conceptualised in relation to the processes and experiences of those involved?***

Is learning enhancement conceived primarily in quantitative terms? For example, many studies make use of the scores or grades achieved by students on specially-devised 'before' and 'after' tests. Others use the normal assessment requirements of a course, usually comparing the results of one 'with technology' cohort of students with another 'without technology' group. Such measures indicate that enhancement is conceived in *quantitative* terms: demonstration of enhancement requires determining whether the technology innovation is associated with more (or less) learning being achieved, through the proxy of test scores.

Alternatively, an innovation might be seeking to achieve outcomes that are more *qualitative* than quantitative. For example, designing students' use of technology for the purpose of:

- Developing and deepening knowledge and understanding, not simply in terms of knowing more (facts, principle, procedures, etc.), but of knowing differently (more elaborate conceptions, theoretical understanding, etc.);
- Developing an understanding that knowledge is contested (legitimate differing perspectives) rather than absolute;
- Developing a range of 'generic' or 'life' skills, e.g. critical thinking, coping with uncertainty, ability to communicate appropriately with different audiences, working effectively with other people, capacity for reflection upon practice, etc.

Qualitative data collection is almost certainly necessary to demonstrate that the desired qualitative improvement had been brought about.

Whether improvements were conceived in quantitative or qualitative terms, it would never be sufficient to simply ask students whether they felt that their learning had been enhanced. Not only does this not *demonstrate* that any enhancement has been achieved, it also assumes that each student shares their teacher's understanding of what that enhancement actually involves. For example, what valid interpretation can be deduced from aggregating students' responses to the questionnaire item "Do you feel that your learning has been enhanced by x"?

Further, for desired outcomes to be achieved the contextual circumstances must be appropriate. Most notably, the assessment methods and criteria must support those outcomes. The assessment for a course or module constitutes the *de facto* curriculum (Brown, 1997; Havnes, 2004; Rust, 2002; Sambell & McDowell, 1998). Assessment determines what learners do when studying: not only **what** they attend to (and what they ignore), but also **how** they go about learning (Kirkwood & Price, 2008). When students are expected to make use of tools such as wikis, blogs, podcasts, etc. within their normal studies, many will not bother to do so unless using the tool contributes in some way to the course assessment requirements.

### ***Establish what evidence is considered necessary or appropriate to demonstrate the achievement of enhancement(s)?***

Any research or evaluation study that aims to gather evidence of better student performance or learning improvement must ensure that relevant forms of data are attained. Kirkpatrick's four-stage evaluation model (Kirkpatrick, 1994) proposes that the effectiveness of education/training is best evaluated at four progressively challenging levels – *Reaction, Learning, Behaviour* and *Results*. Students' reactions might indicate feelings of satisfaction or positive attitudes, but are never sufficient to determine what learners *know* or what they *can do* as a result of an intervention. 'Learning gains' can only be established by the gathering of appropriate evidence, for example by students demonstrating their understanding or their ability to perform desired tasks or actions. Demonstrating improvements in learning,

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especially those of a qualitative nature, can be difficult and will usually require the use of several data collection methods.

If course assessment is to be used as one form of data collection for a project, it is vital to ensure that the assessment method(s) used is appropriate for the outcomes being sought by the intervention. For example, if a wiki or discussion forum is introduced to encourage students to work collaboratively, the associated course assessment will need to acknowledge and reward group working practices. If assessment remains wholly focused on the outputs of individual students, the 'backwash effect' of assessment (Watkins et al., 2005) will lead learners to revert to competitive rather than collaborative ways of working.

### ***Ensure that the findings justify the conclusions drawn and that no unsubstantiated generalisations or recommendations are made***

The findings from a research or evaluation study must substantiate any conclusions or recommendations made. Our literature review (Kirkwood & Price, 2014) found articles in which this was not the case. Favourable reactions from learners (particularly if only responses to multiple-choice questions) should not be presented as the sole source of evidence for learning improvement. In situations where technology has been used to *supplement* existing teaching, any enhanced performance could result from the provision of additional teaching resources or learners spending more time on activities. Similarly, where teaching has been altered significantly to include technology use, researchers must be aware that because changes to several variables have been made, it is inappropriate to claim that just one element (i.e. technology) has been responsible for bringing about any change in outcomes.

Over-generalisation should be of concern. It cannot be assumed that findings from research undertaken in one particular educational context can necessarily be applied in any other context. Often studies provide insufficient details about the context, the design of learning activities, the precise use made of technology, the expected outcomes and the means by which learners were assessed for readers to be able to determine the extent to which findings might be of value elsewhere (Thorpe, 2008).

### ***Maintain an appropriate perspective: clearly differentiate the complexities of the 'here and now' from the idealised 'potential' of any new technology.***

All aspects of the educational transaction need to be considered, not just the technology being utilised for teaching and learning. There are two major drawbacks when technology itself is taken as the focus of an investigation. First, there is a tendency to consider the technology as the *agent* of any changes observed, rather than the design of teaching/learning activities make use of technology. The key is how teachers design learning activities appropriate for their students to achieve particular educational outcomes or goals. There are always dangers involved in trying to generalise from one specific context to another. Second, it is always important to consider what innovative role any technology is playing. Is it providing a new means of delivering existing pedagogy (*replicating* or *supplementing* existing teaching), or

does it contribute to new pedagogical approaches and changes in what and how students learn (*transforming* the learning experience)? Often teachers and researchers are so enthralled by the potential of new technologies that their sense of perspective is impaired. Many investigations fail to take account of and build upon lessons learned from research into the use of educational media and technologies conducted over previous decades, much of which remains highly relevant.

## Conclusions

We contend that research and evaluation studies of learning technologies should be conducted with greater rigour and validity. However, it is not a matter of simply following prescriptions about adopting specified research methods or approaches to achieve ‘scientific’ rigour. It is more about proceeding in a scholarly way, investigating the aims and goals of an intervention in order to pursue **all** relevant aspects of the educational situation and circumstances. Explicit consideration of the assumptions and epistemological models underpinning both the approach to teaching and learning being adopted and the anticipated research methods is essential. The investigation, including any literature review to determine what is already known, should not be focused primarily on the technology being used, but on all relevant aspects of the educational context. All conclusions and recommendations must be supported by evidence and not exaggerated in their claims for applicability in other contexts.

If the guidelines in this presentation are followed, it should contribute to research and evaluation studies achieving higher quality and validity and to results and conclusions that avoid many of the pitfalls and shortcomings that we – and many others – have identified. Consequently, the potential for achieving greater impact will be improved.

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## **BELONGING AND MATTERING THROUGH A TECHNOLOGICAL LENS – MEETING ONE CHALLENGE FOR OPEN AND DISTANCE LEARNING IN 21ST CENTURY**

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The student experience for online and distance learners in Australia has generally been considered from the perspective of ‘study-load’ and separate from the personal, emotional and social context of the student’s ‘life-load’. The case study reported here contributes to the existing body of knowledge by examining the way in which engagement with students at a regional Australian tertiary institution can be developed and maintained by actively listening and responding to the voice of the student through a mixed suite of technological tools. What follows is not concerned with statistical analyses, nor is it focused on engagement and retention in relation to specific disciplines or courses. Instead, it presents one component of a larger study designed to develop a greater understanding of the nuances of the lived experience of student engagement. This work aims to understand the role that technology can play in the developing the emotional dimensions of belonging and mattering as experienced by students who are dislocated from their campus.

Unlike other universities within Australia, UNE is in the unique position of having 80% of the student body studying via distance. Historically this has presented the institution with the problem of how to engage students in such a way that they feel involved and a part of the University community. Early Alert has provided a solution to this challenge with benefits for both students and the University. Emotional connection, and its role in building a sense of belonging, has been explored through a range of theoretical perspectives including Belongingness (Baumeister & Leary, 1995; Dixon Rayle & Chung, 2007) and Mattering (Schlossberg, 1989; Schieman & Taylor, 2001). Existing evidence suggests that the need to belong is a powerful, fundamental, and extremely pervasive desire for students in higher education (Tinto, 1975; Baumeister & Leary, 1995; Bryson, 2011; Thomas, 2012) and belonging is a key concept closely aligned with both academic and social engagement. To be able to experience a sense of belonging, individuals need to have a clear sense of their own role, purpose and place within the defined environment (Bryson et al., 2009). The challenge for institutions with online and distance learners is the capacity to nurture supportive peer and staff–student relationships and to build strong self-concepts of studentship (Thomas, 2012) that are relevant to the diverse attributes of students who are geographically dispersed from each other and the institution. While student engagement and a sense of belonging may be considered fundamental to a positive student experience, the two concepts have generally

been developed and explored within the context of place and community. By their very nature, online and distance learners do not share a place-based context and this presents a significant challenge for institutions committed to enhancing the experience of these students.

Current work at the University of New England (UNE), Australia is based on a strong belief that self-concept is central to the engagement of online and distance learning students and that this self concept needs to be situated within the academic sphere as a compensation for the dislocated sense of place and community they experience. A typical UNE student is likely to be physically distanced from the campus and is likely to be balancing multi-dimensional life responsibilities along with their study. It is unlikely that he/she will ever have an on-campus experience and his/her capacity to create strong person to person relationships is hindered by this physical dislocation. It is therefore incumbent on the institution to find alternative ways to manage the relationships between students and staff and between student peers in ways that are aligned to the specific features and expectations of these populations. UNE, a regionally-based distance education provider, has always prided itself on a personalised approach to students and one advantage of its' on-line education model is the opportunity to leverage service and teaching delivery off emerging technologies.

## **The Site**

UNE is situated inland of the east coast of Australia mid-way between the two capital cities of Brisbane and Sydney. The student population at UNE is defined by its regionality and distributed nature. More than 70% of UNE students study in off-campus mode, 40% of students overall come from rural and remote locations and 4% are from isolated areas. In total, more than 50% of UNE students identify as part of low socio-economic groups. The largest proportion of students (approximately 70%) is aged 25 or older. Many of these students combine the dual demands of work and study and their level of engagement with the University is sometimes hampered by the multi-dimensional nature of their lives. These factors contribute to a diverse and dispersed student community yet the University consistently rates well for educational experience and student satisfaction through national surveys.

## **Action and Research**

The UNE Early Alert Program (EAP) forms the basis of an ongoing modified action research project. The cycle for each sequence is limited to the most current teaching period and enrolled students are participatory in each of the strategies deployed. In sequence, each teaching period's engagement activities are planned, implemented and reviewed for efficacy. The actions under scrutiny are evaluated through the voice of the student. The flexibility of this type of model ensures that student engagement activities are responsive to the emerging needs of the student population and the cyclic nature of the student experience means that outcomes are time specific and improvements are iterative. EAP is an innovative program which identifies and supports students, irrespective of where they study. It uses multiple data

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sources to automatically highlight students who may be ‘at risk’ of disengagement and through case-management afford them every chance of success. A suite of wrap-around services, which are aligned to the student lifecycle, ensure that a consistent and cohesive model of support is centred on building pride in studentship, enhancing the sense of belonging and mattering of students, and providing students with instrumental resources which enable them to develop self management skills. Analytics perform a gatekeeper function, assessing, the impact of specific interventions on the student experience and determining if activities are retained or discarded according to the level of resonance with the student population. The project unpacks the issues of concern identified by individual students; the way in which these concerns are ameliorated and the impact this has on student progression into the next teaching period. Within these parameters, the dimensions of mattering and belonging are measured according to student feedback.

### **Early Alert**

In initiating the Early Alert Program, two constructs were developed to examine the student experience and to establish a clear base from which to develop and measure the effectiveness of the technological tools used to engage with students. The first was the construct of *happiness*, adopted to describe the self reported state of satisfaction with the student experience and the second, *wellness*, used to describe the students’ preparedness for study. These two constructs provide a holistic view of the student experience. *Happiness*, is identified through self-reports of students via site developed tools such as the *Emoticons* and *the Vibe*; *Wellness* through system identified triggers via the *Automated Wellness Engine*. As an outcome of the action research methodology, this program has been iteratively developed since 2008, both adding and deleting specific actions as appropriate. Each action is measured for student ‘traction’ and qualitative feedback is used to gauge efficacy from the students’ own perspective.

The student-centred nature of this project is best described through the voice of the student and what follows is one typical student journey examined through the filter of Early Alert at UNE.

Mary<sup>1</sup> is Australian born, 35 years old and working part-time. She has three children of school age and she lives in a regional centre in eastern Australia. She completed secondary school but this is her first effort to undertake tertiary studies. She is time poor, balancing work, family, community and now study responsibilities. She is the first in her family to attempt a university degree. It is unlikely that she will attend the Armidale campus before she graduates. Most of Mary’s transactions with UNE will be managed online and she will communicate with staff via multiple channels.

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<sup>1</sup> Mary is a constructed character, broadly representing a typical student. Her characterisation reflects a typical student demographic (female ; age 25 plus; studying by distance education)

When she first enrolled, Mary had no understanding of the processes of applying for study or enrolling. A telephone call or email to the University may have assisted by providing information and guidance in administrative processes but these remain largely impersonal if that is the only way for a student to communicate with the institution. Mary can however, access one of the YouTube videos created by the Early Alert Team (<http://www.youtube.com/user/UNESupport>) so the subject matter experts at the University can present (via video) the guidance she will need to complete most administrative processes. Mary can telephone, email, use online FAQs or live-chat to clarify the steps she needs to take and the YouTube tutorials help personalise this experience. Each transaction, recorded in the student relationship management system, is reviewed for student satisfaction and Mary is reassured that her opinions matter.

One week after on-line enrolment, Mary is surprised when she returns home from work to find a package from the University waiting on her doorstep. Guided by affective motivation approaches (Estell & Perdue, 2013) the commencement packs were introduced in 2013 to reinforce the high level of initial enthusiasm and motivation of new students to commence study; to demonstrate that at UNE each student matters; to build the message that we are here to support individual success; and to build a sense of belonging. As indicated below, students like Mary experience each of these affective responses to what is a simple set of artefacts of studentship.

*Wow! What a great way to start my first official day of university with a parcel at my front door full of information and goodies. It was just the motivation I needed to get me excited and engaged in the new and challenging adventure I'm now embarking on.*

*In particular, the "New Student Guide" is full of great information, handy hints and tips and contacts to help me through my time at university. I know the guide will be a very useful resource for me now and the whole way through my time at UNE (UNE, 2012, internal report).*

The practicalities of studying means that Mary needs to be able to balance her total set of responsibilities as well as her study expectations. Achieving this, in isolation from her peers however, can make a three or five year degree program, a very isolating experience. Mary is able to share her feelings with her peers through the *Vibe* word cloud. The *Vibe*, collates feedback from students; it updates instantly (when students respond to the question 'what's on your mind today?'); and allows Mary to see how her fellow students are feeling. This is incredibly powerful feedback for students and the EAP team is able to respond appropriately where issues are identified.



Despite her choice to study from a distance, Mary still wants to engage and communicate with her peers and the wider university community. The *Insider's Guide to UNE* which is the current students' blog has been running for 5 years and is hugely popular with students across all ages, disciplines and levels of study. It provides information and advice relevant to the issues raised by students and it complements the *Vibe* and *Emoticons* by closing the student feedback loop. Mary can find out about key dates and study deliverables, ask questions of her peers and the institution, keep informed about activities being promoted both on-and off-campus and generally experience a sense of belonging to a neighbourhood of support. The use of these tools is voluntary and relies on individual students' own expressions of need. One student represented a common attitude when he posted to the blog,

*Can I just say how much I love this blog? It really makes the university accessible for external studies (student feedback, 2012).*

But how do we know if Mary is struggling with her studies if she doesn't tell us? Living a multi-dimensional life may find Mary struggling to balance her employment and study commitments. Her children may become ill or her aging parents may be requiring additional support. As a consequence, Mary may be absent from the learning management system for a period of time. Luckily, the *Automated Wellness Engine (AWE)* identifies a change in Mary's interactions with her studies and a student support staff member contacts her to offer assistance. *AWE* was developed in 2010 to support the *Vibe*, *Emoticons* and the *Insider's Guide to UNE* blog. As represented by Figure 3 below, this tool calculates an 'at risk' (of disengagement) score for students through a comprehensive learning informatics approach. Identification of at-risk students is based on 34 factors derived from data contained in eight UNE corporate systems. The weighting of each factor can be adjusted, allowing the team to fine tune its approach. Factors measured include e-Motion data, the student's academic history, a lack of recent activity in the UNE LMS or library, information about units being studied (such as historic unit attrition rates), the number of assignment extensions sought and the non-submission of assignments. Current weightings and trigger points have been developed as a result of the past experience of the university staff in working with students and a data mining exercise based on a dataset from 2009-2012 have confirmed their relevance for the UNE population.

This approach enables the institution to capture the student experience of Mary and her peers in a manner not previously possible. The wellness/happiness reports produced by the *AWE* are condensed to identify the 200 most 'at risk' students each day and this forms the day's caseload for the centralised support teams who triage each student's situation and identify the immediate and longer term issues impacting on the individuals' engagement with their studies. Students like Mary, have commented,

*Thank you for your help- if you had not contacted me having noticed I was getting behind I may well have simply given up (Student feedback, 2011).*

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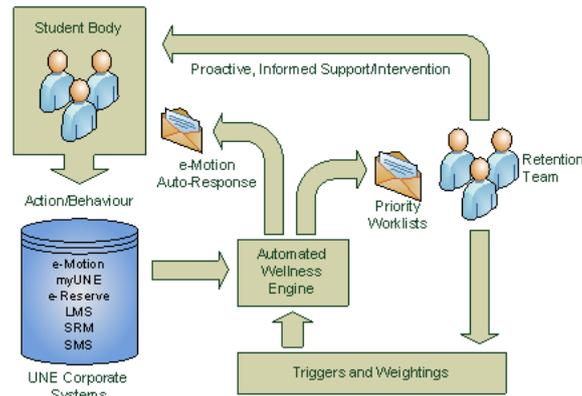


Figure 3. the AWE

The types of issues identified through the triage process include health, personal, administrative and academic concerns. Once presenting issues are clarified, students are referred to the most relevant support service for assistance. The common issues of the day are also addressed by items and tips on the *Insider's Guide to UNE*, Facebook and Twitter. For Mary, this system means that we will contact her throughout her studies when we detect that her circumstances are changing.

Mary's journey is indicative of the way in which the UNE approach takes advantage of technology to engage students in meaningful ways through:

- Just-in-time' and 'just-in-case' communication campaigns;
- Tools and opportunities for students' self-identification of need and self-determination of assistance;
- Targeted interventions for identified groups in need; and
- Personalised intervention and support for individuals.

### Unpacking the issues

One major objective of this project is to better understand the emotional dimensions of student engagement and the data collected from student interactions with the student support model have presented a depth of understanding of the lived experience of UNE students, not previously possible. Students identified as being 'at risk' of disengagement through the *Emoticons*, *Vibe* or *AWE* are individually contacted to clarify the issues impacting on their studies. This demonstrates to the student that they matter to the institution and it builds the institutional understanding of the student experience. As represented by Table 1 below, administrative matters are most commonly cited by students as having a negative impact on their experience and these are generally associated with the logistics of the students' studies. Seeking waivers of rules, non-standard requests to vary their enrolment or general information to do with the process of enrolment or progression are most common. These are matters which can be easily remedied, thereby removing one impediment to a good student experience. Academic and personal matters each account for approximately one quarter of the

presenting issues in any given teaching period. When combined, these three categories represent the life-load and study-load demands of online and distance learners.

Table 1: Presenting Issues for Early Alert Participants- Trimester 1 2014

<b>Issue Type</b>	<b>%</b>
Academic	21.28
Administrative	53.68
Personal	25.04

Once the immediate issues of concern are clarified, students are referred to the most appropriate support service. During the period reported here, students were referred to student administration (17.91%) unit coordinators (16.57%) and in lesser numbers to a range of support services and organisations including academic skills; library; safety and security; counselling; disability support; examinations unit; and careers. This type of information alerts the institution to the support needs of students which if left unaddressed result in withdrawal from studies. In examining the reasons for student withdrawals, it emerges that students who were early alert participants were more likely than their peers who did not participate, to drop a unit if they were dissatisfied with their study experience (+2.42%) or if they experienced a health issue (+2.61%). These students were however less likely (7.18%) than their peers who had not participated in early alert to drop a unit of study due to employment or work conditions which may be attributed to the support they received to overcome a short term issue.

Table 2: Comparison of unit discontinuation reasons between EA participants and non-EA participants - Trimester 1 2014

<b>Reason</b>	<b>Non EAP</b>	<b>EAP</b>
Access or Technology Reasons	1.43	1.51
Dissatisfaction with Unit	3.74	6.16
Employment or Work Commitments	34.03	26.85
Financial Reasons	4.09	3.98
Health Reasons	13.14	15.75
Other Reasons	12.33	15.52
Personal or Family Reasons	31.24	31.23

## **Conclusion**

The Early Alert Program is underpinned by four key technological approaches to identifying the individual needs of students. These are the self reported student happiness (or satisfaction reported through tools such as *Emoticons* and the *Vibe*); system reported wellness (or preparedness for study) reported through the *AWE* and a communication strategy which utilizes a range of media such as a blog, Facebook and twitter. Early Alert has established a distinctive process through which to identify students who may be at risk of disengagement, to intervene early, diagnose potential areas of concern and refer the student on to appropriate support services. This process supports the emotional dimensions of belonging and mattering of students and is consistent with the belief that a sense of belonging is ‘more than simple

## **Belonging and Mattering through a Technological Lens – Meeting One Challenge for Open and Distance Learning in 21st Century**

Rhonda Leece

perceived liking or warmth, it also involves support and respect for personal autonomy and for the student as an individual' (Thomas, 2012 citing Goodenow 1993, p35).

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## **PEDAGOGICAL SPEEDBUMPS AND LIFE'S POTHOLES AND DIVERSIONS ON A DISTANCE LEARNER'S JOURNEY**

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### **Introduction**

This poster presentation reports on a pilot study aimed at testing out a range of diary data collection methods. Over a two-month period, I engaged with a small sample of distance-learning students studying an introductory health and social care module to assess their subjective experience of studying. One aim was to evaluate the quality of data obtained by the different diary methods and the practicalities of handling the different formats and incoming flow of diaries. A second aim was to determine what aspects of the student experience the diaries were able to reveal. Third, this pilot sought to inform a more extensive longitudinal study of the student experience in our health and social care courses. The pilot study also represented a useful 'public engagement' exercise that encouraged students, as our 'public', to help shape the research questions and methods of any subsequent study.

### **Background**

The idea of flexible learning has become entrenched in the higher education discourse, with the sub-text that it is beneficial for students to have some flexibility and control over their studies. Barnett (2014), however, provides a more considered view of the meanings, implications and desirability of flexible learning. According to Barnett, flexibility can simultaneously render a student exhilarated at the possibilities open to them as well as anxious about their chosen approaches to study.

An additional aspect of higher education of perennial concern is student retention and progression. Achieving a better understanding of the daily lives of some students, and how they integrate their studies alongside substantial work and family commitments, can contribute to initiatives aimed at improving student retention and progression. End of module surveys provide limited information on learners' experiences, and in the distance learning context centrally based staff commonly have no contact with students unless they engage in the asynchronous forums. Therefore, diaries potentially offer a rare glimpse of the world of the Open University student.

Qualitative diaries are means of eliciting contextualised accounts of experience, and over a period of time can provide a longitudinal perspective on the experiences of individuals

(Hawkes et al., 2009). Video and audio diary methods are increasingly popular (Cooley et al., 2014; Bernays et al., 2014; Monrouxe, 2009; Jefferies & Hyde, 2009), although the simplicity of handwritten diaries allows research participants greater freedom to fit them around their everyday lives (Hedman et al., 2011) and can minimise intrusion (Alaszewski, 2006).

## **The context of the study**

A key marketing mantra of distance learning emphasises the flexibility it affords students. Open University students have some flexibility and choice over how and where they study, but they still need to adhere to study schedules and deadlines for submission of assessed work. K101 'An introduction to health and social care' is a core introductory undergraduate module for the Faculty of Health & Social Care at The OU. As well as providing an overview of experiences and practices in health and social care and introducing theoretical concepts, K101 also has a role in developing study skills in a way that is accessible to a 'widening participation' audience. K101 is divided into weekly study units, each of which develops a discrete topic in health and social care (e.g. the design of care environments). Directed study for K101 takes 10-14 hours a week. As students work independently through these units, they encounter 'activities' that invite them to engage in additional sources of information and case material. These resources are typically book chapters or other short readings, audio, video, and web pages. At the time of this study, the K101 units are sent to students as bound workbooks, as well as being available for download in multiple electronic formats.

In the context of ongoing review of student engagement with the K101 learning materials, and a desire to gain greater insights into students' study experiences and behaviours, it seemed appropriate to pilot a diary study. Given the increasing popularity and successes of audio and video diary methods, I was keen to discover the practicalities of gathering this type of data from K101 students. Recognising the difficulty of recruiting time-poor students to participate in qualitative research and the reticence of some to experiment with technology, I also wanted to make the invitation as open and flexible as possible. I was, however, aware of an internal survey that identified a significant percentage of students in the Faculty of Health & social care were owners of smartphones and tablets, which they used for study purposes. Therefore, I was optimistic that some students would want to use their smartphones or tablets to make audio or video diaries.

## **Method**

### ***Recruitment***

The student survey team at The OU emailed an invitation to 400 random K101 students about three months into the course. Eight students responded to the email, seven of which went on to participate in the study. Interestingly, although the K101 student population is 85% female, five of the eight respondents were male.

## ***Diary keeping***

Volunteers were invited to choose from a menu of several different diary methods:

- Receive a regular call from me, in an agreed time slot;
- Call a phone line to record a message (as often as required, but once a week minimum encouraged);
- Make a short voice recording on a smartphone, tablet or pc and uploading it to a secure website (as often as required, but once a week minimum);
- Make a short video recording on a smartphone or tablet and uploading it to a secure website (as often as required, but once a week minimum);
- Keep a written log of study experiences and send it to me (as often as required, but once a week minimum).

Seven students proceeded to keep study diaries. Five chose to send weekly written diaries by email, and two elected for a weekly or fortnightly phone call. None chose to keep audio or video diaries.

Prior to the start of the diary, I arranged a telephone conversation with each participant to explain further about what I was hoping to achieve, and to gain further buy-in to the process by negotiating the practical arrangements for the diaries. I provided participants with prompt questions to indicate the kind of thing I wanted them to write about. Diary keeping was limited to a two-month period, at the end of which I arranged a further phone conversation to evaluate the diary-keeping method and find out any further insights about questions that needed to be asked in future.

## ***Handling, selecting and coding the data***

For the two participants who chose the regular phone calls, I made notes during the conversation and immediately afterwards wrote them up using word processing software. It mostly seemed appropriate to make the notes in first person, and I represented participants' speech as closely as possible. The participants who wrote their diaries either wrote them in a word processor and sent them to me as email attachments or wrote them directly into an email. I replied to each email as it came in, giving encouragement and thanking the students. I then organised the diary inputs in a spreadsheet, aligned to the question topics. Working with the data, I determined aspects of the study diaries that were telling in some way, holding significance for aspects of module design. I then organised these significant experiences under themes in order to give shape to the developing insights.

## **Findings**

The diaries revealed that time and pace were essential concerns for all participants. The students experienced many life events and study situations that presented obstacles to achieving their study goals during the diary period. Through qualitative content analysis, I

developed themes and applied the metaphor of a road journey to represent these tensions. I also reflected on the affordances of diary methods in revealing students' use of their time.

'**Speedbumps**' represented aspects relevant to learning design that made students 'slow down' or interrupt their flow.

For example:

*I find it difficult to juggle – the books are around me on the floor, on the desk – Resources, Reader, blocks, jotter, pc, assessment guide.*

*I have tried to be clever with the K101 essay due in on Thursday and it's backfired. I have skimmed read Block 3 in bed over the past fortnight, just concentrating on pages which I think are relevant to the essay. But I sat down last night to write the essay and soon realised I'm simply don't understand the material well enough to do it.*

*When there is mainly reading, it feels relentless. No DVD to break it up. Then, I lose concentration.*

*An activity at the start – it had a grid to write your own answers. I thought about the answers, but I didn't write anything down. I have mild dyslexia. Writing takes me a long time – it doesn't seem helpful. I also have ADD and my attention goes.*

'**Potholes**' represented life events and situations that made studying more difficult.

For example

*Went to visit the mother of a patient who had recently had an overdose and passed away, after this I did not manage to get back into the frame of mind to continue studying*

*It was half term. I have three young children, so we had family trips, and attended two weddings so we did a lot of travelling. I did the DVD activities in the car.*

*I am frustrated with the tiredness when it comes to studying. I need time to unwind after work, and sometimes just stare at the TV, ordering my thoughts. I've observed burnout in colleagues which adds to the tiredness I feel.*

*I have found it difficult. I'm taking medication for bipolar disorder. I need longer to write things down.*

*My computer has blown up or something and I'm unable to use it at the moment*

*Due to time constraints, I have not looked at the activities. I only do ones that really appeal to me as interesting.*

'Diversions' represented distractions that took students away from their planned study path.

For example:

*External factors this week meant I didn't finish the reading. I did half the reading. I was asked to bake a cake.*

*I attended a funeral on Friday and a wedding on Sunday. I had to have an extension for TMA04. I had to sit down and literally tell people to leave me alone to do this. There was so much going on, it felt everybody wanted a piece of me.*

*Taking a patient some distance to Rehab today, so unable to continue reading*

*Job interview, followed by 2 days training, so no K101 work completed*

## **Discussion**

Although this study involved a very small sample of students, it did facilitate theme development and a process of coming to improved insights about K101 student experiences of study. It has also provided important insights into how students interact with the study materials and some of the choices they make regarding the use of their available study time. Without fail, each of the participants declared themselves reluctant to engage with voice recordings, as well as expressing misgivings about their proficiency with the technology involved with such recordings. The two students who opted for regular telephone conversations had personal issues with their ability to read and write – either dyslexia or visual impairment. For those who did complete the written diaries, their reflections were that it was easy and fitted well alongside their study activity. Some described the perceived benefits of being able to reflect on their studying in this way. The time taken by the investigator in keeping up with the incoming diaries was an important aspect of the diary method that needs careful planning in any larger studies.

## **Conclusion**

This pilot study has been a worthwhile exercise in engaging with students in 'real time' as they study K101. It has provided insights into the acceptability of diary methods for this group of students. It has also revealed some important practicalities from the investigator's viewpoint.

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## **ICT IN EMANCIPATORY EDUCATION: AN APPROACH TO CRISIS ALLEVIATION**

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### **Introduction**

This paper suggests a model for the integration of Information Communication Technology (ICT) in Emancipatory Education as an approach to crisis alleviation, seeking to explore the social, economic and political benefits it can provide for individual and society (including the world society in a globalised context). This research application has been developed in the backdrop of a European Union in a deep and unprecedented economic, social and political crisis, manifested in a dramatic increase of poverty, unemployment and racism too (Eurostat, 2013). During the past decade ICT has evolved and grown to play an increasingly important role in fostering and driving education innovation and addressing the above challenges (e.g. EESC, 2013; UNESCO, 2011; Eurydice, 2012), and it has been a key priority in several flagship initiatives of the Europe 2020 strategy. Nevertheless, so far, ICT has been often used in formal education merged with behaviourist learning theories and traditional transmissive teaching practices without achieving sustainability and without being able to address global problems. In the proposed research, we are going to develop a Critical-Reflective Model for the integration of ICT into Emancipatory Education (Fragkaki & Lionarakis, 2010). Our proposed model will include theory, praxis, tools, and their evaluation in practice. ICT in Education can, in theory at least, serve any learning theory and teaching methodology. The proposed research has a definitive purpose, to integrate ICT in Education in order to empower the learners of any specific ‘content’ to deal with the bigger issues of the current crisis; it provides a specific learning theory for that purpose, the “Emancipatory TEL paradigm” and a specific teaching and research methodology, the “Emancipatory Action- Research”.

### **Main principles for planning the ICT integration in Emancipatory Education**

- Emancipatory TEL means the integration of ICT in education within the framework of “emancipatory cognitive interest” (Habermas, 1972) with the goal of forming a critical consciousness in individuals and communities, aiming at autonomy, responsibility, justice, equality and action for social change (Carr & Kemmis, 1997).

- The educational subjects are authentic and with social meaning, concerning the learners interests and the issues/problems of the wider society in which they live. Educators have the opportunity to co-develop, together with their learners, the content of the educational material and the educational process.
- Learners function as vehicles and not as instruments of change and educators are transformed from facilitators of the learning process to “critical friends” and advisors.
- ICT tools are integrated in the pedagogical process through emancipatory action-research and problem solving methodologies and they are transformed from technical to cognitive tools, and from those, to emancipatory.

## **Common features**

Summarizing our review of the state-of-the-art in ICT in Education and our criticism of the previously mentioned projects:

- Several ICT approaches in Education, so far, have been purely technocratic through Positivist-Technocratic Models that do not originate from the educators’ personal and professional needs but from the “objective” propositions scientifically documented for society, politics, and organization, which they then transform into recommendations for educators’ training and professional development, while focusing only on the practical aspects of education. A few, smaller-scale and less known projects, are Critical-Reflective Models (in the proposed research, we are going to develop a Critical- Reflective Model for the integration of ICT to the Emancipatory Education).
- Some aspects of Emancipatory TEL are present, but not explicitly and certainly not fully. (Explicit and complete adoption of Emancipatory Learning Theory in an ICT environment is the primary goal of this research).
- The connection between emancipatory learning and technology is loose; so far, it is mostly of the “nice-to-have” type: either emancipatory learning with technology or alternatively technology-enhanced with emancipatory goals, whichever is the most feasible. (In this research, we shall extend the theory and practice to show the deeper and necessary connection between emancipatory educational goals and practices on the one hand and utilization of ICT on the other).
- The connection between economy-driven training and education for the labour market on the one hand and educational theory and methodology that promotes 21st century skills and emancipatory goals on the other is missing (In this research we shall apply our model and experiment in subjects for which economic demand exists but in a way that cultivates advanced cognitive skills and serves emancipation).

## **ICT-EmanALL Research Objectives**

Recognizing all the above factors and the fact that ICT integration in Emancipatory Education is not a positivist-technocratic perspective but rather a transformative knowledge creation process for the involved learners (& educators) and learning community in general, our

approach will add value to Education for the alleviation of the economic/social/cultural impacts of the economic crisis on society by achieving the following objectives:

1. Introduce and investigate a conceptual framework of the innovative “Emancipatory Technology Enhanced Learning” (TEL) paradigm with a view to alleviate individual and communal global crisis consequences. We will provide the theoretical grounding for the development of a pedagogy that links technology and learning, as a process based on the “emancipatory cognitive interest” of transformative knowledge creation. We will integrate this Emancipatory TEL paradigm into education, and this synthesis is going to change our approach to ICT and transform it from a merely technical environment to more cognitive and an emancipatory one. We are going to create an e-Repository for the Emancipatory TEL paradigm that will provide the theoretical grounding for the Emancipatory TEL.
2. Provide an ICT Critical-Reflective model to crisis alleviation (“ICT-EmanALL”) with three dimensions: a) training, b) researching and c) acting/teaching. Critical communities of educators are going, on the one hand, a) to be trained on the emancipatory TEL paradigm, and, on the other hand, they are going b) to investigate their work in real conditions. We intend to apply the ICT-EmanALL model through an emancipatory Massive Open Online Course (“eman-MOOC”). The Research Methodology part of this proposal, which follows in the next section, shall address the Critical-Reflective Model.

**The “ICT-EmanALL” Research Objectives are linked to the following research questions:**

Emancipatory TEL paradigm as a transformative knowledge process: What drives the “emancipatory cognitive interest” framework of transformative knowledge creation through ICT? How can we extend the theory, linking emancipatory approach and ICT more deeply and more effectively into education? Furthermore, how to determine whether the strategic issue of integrating Emancipatory TEL in EU education systems has been well identified, whether it can accelerate progress and add value, whether it deserves the priority assigned to it and whether the action strategy has been well chosen (strategic feedback)?

ICT-EmanAL: a Critical-Reflective Emancipatory TEL Model to crisis alleviation: How the Emancipatory TEL paradigm can apply in areas that provide education on subjects necessitated by the crisis, but in a way that fosters and addresses 21st century skills and goals that serve emancipatory learning towards crisis alleviation? Which innovative ICT environments and tools – and within which ways – can create new and transformative knowledge through emancipatory cognitive interest? Furthermore, there are many obstacles that are created by the socio-political context, which are creating barriers to the efforts of individuals or communities of educators. Through which methods the Emancipatory TEL paradigm will be capable to empower and transform educators/students/citizens from passive recipients or followers of instructions and commands to critical-reflective and active citizens releasing them from forces opposed to innovative action?

## **Appropriateness of research methodology and approach**

The epistemological framework of this model is the “emancipatory cognitive interest” of Habermas (1972). The theoretical frameworks we will consider are the “Critical Constructivism” (Jonassen, 1991; Freire, 1984; etc.) and “Critical Reflection” (Gore & Zeichner, 1995; Schon, 1983; Grundy, 2003; Mezirow, 1991; etc.). Employing the “Activity theory” (Engestrom, 1987), we will design the entire work/activity system of the “ICT-EmanALL” model. The methodological framework of the proposal includes the “Emancipatory Action Research” method, which is going to contribute to the transformation of theory and practice with emancipatory goals, and the “Grounded Theory” method (Glaser & Strauss, 1967) which will help us to discover theory through praxis, through the analysis of data.

Our main body of our research is focused in two broad research activities:

1. Providing the pedagogical framework of the “ICT-EmanALL” Paradigm through an e-Learning Repository: We are going to create an “open-content”, reusable, searchable and interoperable e-Repository for the “Emancipatory TEL” paradigm, which will provide the theoretical and methodological grounding for the Emancipatory Education. On one hand, we are going to collect the relevant existing material from previous works of our partners who will support the “ICT-EmanALL” project, and on the other, we will include educational material that the educators/learners will create with their students, and we will share it with the members of the critical-reflective community of learners. This will be a continuous and complementary operation, which will offer the needed sustainability to the emancipatory ICT model.
2. Providing the emancipatory- Massive Open Online Course which will integrate the “ICT-EmanALL” Model: We intend to apply our model through an emancipatory Massive Open Online Course (“eman-MOOC”), within the instructional design of the “Activity Theory”. We will design an interactive and collaborative course that will integrate critical-reflective and creative emerging technologies (e.g. flipped learning, micro- learning etc.) in order to be social, critical and constructivist as well. Initially, the communities of educators will integrate the “Emancipatory TEL” paradigm, under the social standpoint of an online training process, through a clear pedagogical framework of a systemic 21st skills development, in a way that serves emancipation. We will create “authentic” educational scenarios that refer to social issues, address the interests and problems of the learners and link critical- constructivist approaches with problem solving methodologies, developing high-order 21st skills as an emancipatory approach to crisis alleviation. Secondly, and in parallel with the training activity the educators are going to link their acquired transformative knowledge with their daily action in work by adopting ICT authentic activities in which they have already been trained. Finally, and throughout the training and teaching activity, they will investigate this holistic process via reflections (“in action” and “on action”) that will arise from an “Emancipatory Action Research” that it was implemented from the applicant through the EPICT-Esperides project (Figure 1), within three phases (theory, enlightenment

and action) in order to recognize and understand the social, ethical and political dimension of their teaching alternatives, thus contributing to the transformation of educational theory and practice with emancipatory goals. New intuitions and insights will emerge for the communities of educators, acting as co-researchers, through transformations and reconstructions that will direct them to create and implement emancipatory ICT educational actions.

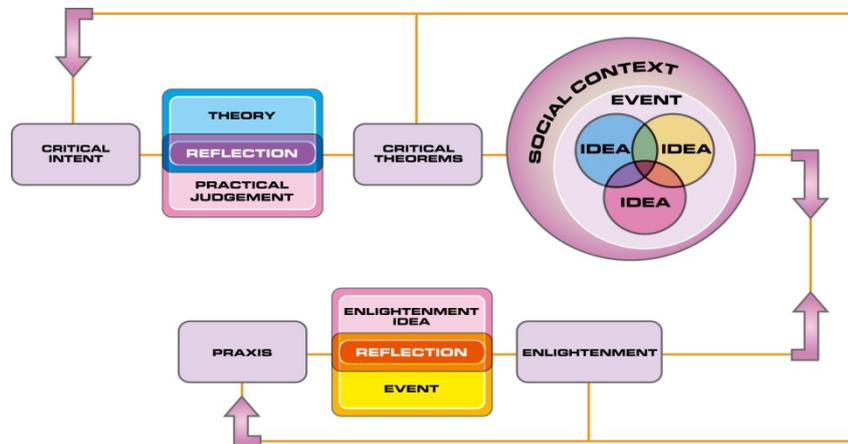


Figure 1. An example of the “Emancipatory Action Research” of the EPICT-Esperides project (Fragkaki, 2008)

## The implementation of the ICT-EmanALL model through the “eman-MOOC”

We intend to design the entire work/activity system of our model (Figure 2) through Activity Theory in order to understand the dialogue, the multi perspectives, and the networks of the model’s interactive systems. Our ICT-EmanALL model has three dimensions:

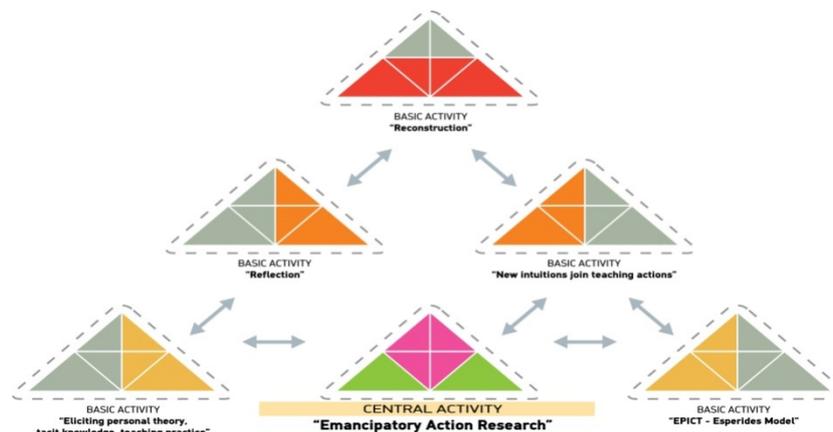


Figure 2. “An example of the “Activity System” of EPICT-Esperides model from the applicant’s thesis (Fragkaki, 2008)

1. The training dimension will be take place through an “eman-MOOC” and will provide the conceptual framework for Emancipatory TEL. For developing the pilot MOOC, as a system, we will integrate some characteristics of objectivist instructional systems design (ISDs) in order to respond to adults’ preferences for a goal-oriented curriculum, but the

developing of the web course will be based on critical adult education in alignment with the Emancipatory TEL. An eLearning Repository will provide “open-content”, reusable, searchable and interoperable Learning Objects (LOs) to educators through a continuous complementary operation that will offer sustainability. This content will contact the conceptual framework of “Emancipatory TEL” through the synthesis of theories, pedagogies, methods, learning scenarios and ICT tools by means of a clear pedagogical framework of a systemic 21st skills development in a way that serves emancipation. The applicant is going to be the trainer of the educators (from the communities of learners from BRUNEL’s external collaborations mentioned above), who in turn, will act in their organizations as the “multipliers” of the knowledge and skills that they will acquire during the training program, for their fellow learners/educators.

2. Concerning the teaching dimension, it “goes hand in hand” with the training activity and it is carried out in real conditions on university and school premises, in parallel. The educators can now apply the “knowledge” they have acquired. Thereafter, they are encouraged to design and author “authentic” educational scenarios using Learning Objects (Los) and ICT environments focusing not only on knowledge acquisition, nor on knowledge discovery, but also on the transformative knowledge process, within the socio-political and ethical dimension of their pedagogical approach. We intend our eman-MOOC to include critical-reflective tools, so that Emancipatory Learning through ICT will find a fertile interactive place to “kick start”.
3. Through the emancipatory action-research dimension the members of the online community as “reflective professionals” and “co-researchers in action”, will conduct an Emancipatory Action Research (see part B1 of the proposal). We shall make extensive use of the “Model of Teaching Change” (Figure 3) that was applied from the applicant in the framework of the E.P.I.C.T-Esperides European project, implemented by the University of Athens, in cooperation with international bodies, in the framework of the “e-Content European Programme”. As one can read from the project’s review: “The research results, that derived from the application of the Transformative Polymorphic Model show that the reflective-critical educators are now more concerned with the “why” and not only with the “what” of the teaching and learning process, thus abandoning neo-behaviourisms and pseudo-constructivist views and practices in the use of ICT. They have surpassed the methodological speculations of the technocrat educators, without overlooking them, they warily question, they cautiously organize their actions and question the ethical and political impact of teaching, specifically (micro-level teaching) and generally (macro-level teaching). Taking into account the examination of the results of the present research, we support that to apply a model with an “emancipatory” orientation is no longer a utopia, but it can be realized within the context of qualitative and meaningful learning. In this way, knowledge is contextual, education acquires a political meaning as an act of socialization and ethos and an Online Education for Liberation is promoted”  
<http://www.clab.edc.uoc.gr/HSci2010/pdfs/HSci2010.pdf>

In this theoretical research framework, the educators participating in the research will reflect “during the action” (reflection-in-action), i.e. while the action is evolving, as well as “on the action” (reflection-on-action), before the action begins, or after it has ended. In the framework of the Reflective-Critical Model, the researcher and applicant, as well, will function as a “critical friend” and her contribution will focus more on enabling the “thought-action” schema.

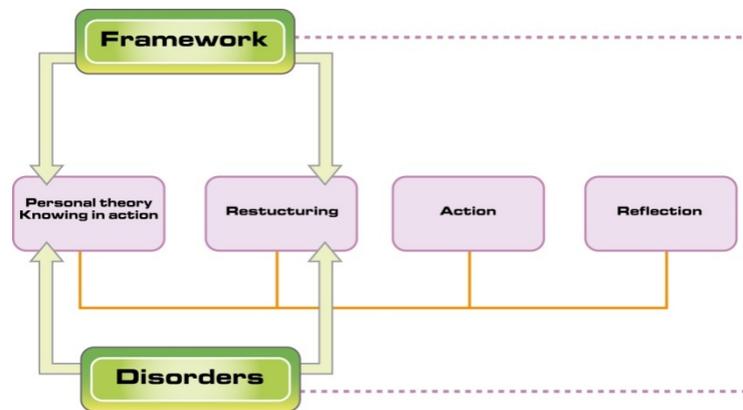


Figure 3. “Model of Teaching Change” of EPICT-Esperides model from the applicant’s thesis (Fragkaki, 2008)

The findings of the training-researching-teaching process, which is a continuous process, will derive from the examination of case studies by the educators participating in the “eman-MOOC” which will be implemented, and from the evaluative study of the educational process, through “Grounded Theory”. This multi-method approach constitutes both a research and a data analysis method, in which a hypothesis is not tested, but discovered, developed and temporarily verified, by the systematic collection and analysis of data. To be more specific, the “Grounded Theory method” (GT) is a systematic methodology in the social sciences involving the discovery of theory through the analysis of data. It operates almost in a reverse fashion from traditional social science research. Rather than beginning with a hypothesis, the first step is data collection, through a variety of methods. From the data collected, the key points are marked with a series of codes, which are extracted from the text. The codes are grouped into similar concepts in order to make them more workable. From these concepts, categories are formed, which are the basis for the creation of a theory, or a reverse engineered hypothesis. This represents a departure from the traditional model of research, where the researcher chooses a theoretical framework, and only then applies this model to the phenomenon to be studied.

We will also implement a formative evaluation – that refers to a process that provides a judgment of the strengths and weaknesses of all the activities involved in the 3-pilot test, across all design and developing stages to improve its effectiveness and appeal. The concept of formative assessment is underpinned by three defining processes: “establishing where the learners are in their learning [in relation to the expected learning outcomes]; establishing where they are going; and establishing what needs to be done to get them there” (Black & Wiliam, 2009, p.7). The input from the evaluation process will be analysed and modelled

using Web 2.0 tools for conceptual modelling and word-clouding in order to be able to identify and visualize the essential concepts and processes. Quality assurance in our model has two directions, one concerning the strategies to be adopted and the other concerning accreditation and recognition of the “eman-MOOC”. These directions are not mutually exclusive, as the first is a condition for the second.

## **Epilogue**

In view of the above factors and the fact that Emancipatory technology enhanced learning paradigm is not a positivist-technocratic perspective but rather a transformative knowledge creation process for the involved community, our approach will add value to Education towards the alleviation of the economic/social/cultural impacts of the current crisis. The work will lead to a conceptual framework of an innovative technology enhanced emancipatory learning paradigm (see Research Objective 1); an “open-content”, reusable, searchable and interoperable e-Repository for Emancipatory TEL paradigm (see Research Objective 1); a Critical-Reflective model for ICT integration in Emancipatory Education to crisis alleviation (ICT-EmanALL) which will engage communities of educators in a training, researching and teaching activity (see Research Objective 2); a 3-pilot test in Primary, Secondary and Higher Education in real world settings, within synergies from universities, schools, institutions and projects all over Europe that will chart the key aspects of ICT in Emancipatory Education. The development of ICT-enhanced environments, as well as a range of educational e-Learning resources and their integration in practice does indeed fulfil the heralded potential of ICT for an education that will link employment-oriented skills and knowledge with high level “21st-century” cognitive skills (OECD, 2013) and emancipatory life attitudes.

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## DIGITAL LEARNING – EXPLORING THE LEADERSHIP FACTOR

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### Introduction

As a medium for higher education new digital media now available present unlimited potential to engage and interact on a global stage, like never before. However, traditional educators in Ireland have been slow to recognise and react to the potential opportunities these platforms present, which currently a new National Digital Learning Roadmap (2014) is seeking to address. Set against the backdrop of the new National Roadmap, this poster describes a study that aims to elicit why there has been such reluctance in the past and to determine the factors which may enable the creation of a rich digital learning culture in the future. More specifically, the poster asks the question: What type of leadership is required in higher education to unleash the potential of new digital media in developing a 21<sup>st</sup> Century learning environment?

### Thinking about leadership

Drawing on the literature on leadership, and in particular the concept of ‘Turnaround Leadership’ (Fullan & Scott, 2009), the proposed research is framed around the following sub questions which explore different dimensions of leadership and institutional culture in the context of digital learning. The intent of the poster is to raise greater awareness of these questions and to seek feedback on the types of issues that are relevant to the study of leadership in the Irish higher education context.

### ***Who – can benefit most from digital learning?***

We need to understand who has the most to gain from access to new digital learning solutions and what support strategies are required for different groups of learners:

- Part-time Students;
- Mature Students;
- Distance Learners;
- Offshore Learners;
- Shift Workers;
- Displaced Workers;
- Retraining for the Unemployed;

- Mobile Students;
- Traditional Students.

### ***What – media should be used by educators?***

Selecting the right media for the particular students and learning outcomes is not as straightforward as often implied. We need to consider a range of technologies from a technical and pedagogical perspective:

- Adobe Connect;
- Blackboard Collaborate;
- E-Portfolios;
- LinkedIn;
- Moodle;
- Skype;
- Twitter;
- Video Conferencing;
- Wiki's.

### ***How – should teachers and students use digital media?***

The value of digital learning depends to a large extent on how it is used. Therefore educational leaders need to recognise that:

- Access should not be taken for granted;
- Digital learning is not a question of taking traditional materials and uploading them to be viewed online, it should be a different experience;
- The pre-existing assumptions educators have about learning influence the decisions they make about how to use digital media;
- Learning can now take place at almost any location in both real time or through asynchronous environments;
- There are now new mobile learning spaces with portable devices allowing for an interactive, media rich, learning experience.

### ***When – should we learn online?***

The real strength of digital learning is that the learner can customise the timing and sequence of their individual studies to match the demands of their personal requirements. Accordingly, it is important to recognise that when used well:

- Digital learning tools facilitate flexible learning;
- Online learning can provide learners with the flexibility to fit their learning around their lifestyle;
- The demands of fluctuating work patterns make time management to the forefront of the organisational skills of a student;
- The expectation to use new digital media can place pressure on work/life balance;

- Online learning opens the door to a global classroom and potentially creates a 24/7 learning environment.

***Why – use should teachers use these tools?***

If new digital media is the solution to 21<sup>st</sup> Century learning, then we need to understand the problem that is being addressed by the technology. When used appropriately, teachers can provide students with a consistently high quality experience along with providing the flexibility demanded by today’s students across a number of dimensions:

- Speed;
- Cost;
- Ease;
- Geographical Spread;
- Flexibility;
- Reflection;
- Analysis;
- Convenience;
- Dependability;
- Diversity;
- Enhanced Rich Media Experience.

***How – can we encourage educators to use online tools to enhance the student experience?***

What needs to be done to allow teachers to recognise that digital media enhance their teaching and expertise rather than inhibit or hinder it? This question strikes at the core of designing a rich environment for 21<sup>st</sup> Century digital learning and encompasses a range of issues, including:

- Leadership;
- Institutional culture;
- Pedagogical beliefs;
- Ownership;
- Policies and procedures;
- Manuals and toolkits;
- Innovation;
- Support;
- Short term wins;
- Milestones and celebrations.

**The research problem**

The above questions illustrate how leadership is a process that requires a multi-dimensional understanding in the context of digital learning. Put another way, leadership operates on a number of levels and needs to go well beyond those in formal leadership positions. Arguably,

many traditional educators fear a loss of competence or expertise when asked to teach and present material online. In this situation a lack of information, understanding or incentives can make the inhibiting forces of loss of status and power stronger than the encouraging forces of enhanced, flexible learning to potentially a worldwide audience. The research aims to investigate this tension with a relevant sample of educators in order to better understand how to harness the support and micro leadership of individuals in helping to overcome the challenge of institutional inertia in such uncertain times.

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## **SPEAKAPPS: STUDIES ON ORAL PRODUCTION AND SPEAKING INTERACTION**

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### **Introduction**

The development of oral skills poses a challenge in language teaching whether this takes place face-to-face, through distance education or in blended learning contexts. Several problems arise: first of all students do not have enough opportunity to use their target language orally because of scarce contact teaching hours and high student numbers in the classroom, secondly, students oral performance is mostly unrecorded and therefore there is little opportunity for the student to revise it or for the teacher to give detailed feedback and design post-task activities for raising language awareness. In addition, online spoken conversation amongst language learners does not always flow easily: feelings of awkwardness, shyness about their L2 performance and nervousness about being able to understand their interlocutor are some of the issues students report. From a language learning point of view, conversations which are not guided or structured within a task format generally show high levels of avoidance with learners opting to speak about familiar topics they already feel comfortable with and not attempting complex structures beyond their level of inter-language. Another source of complaint amongst students engaged in tele-colaborative projects is not knowing what to talk about if left without enough guidance from their teachers. This is the reason why it is important to design adequate pedagogical tasks for students and force them to use the language for a real communicative purpose, within a meaningful context working towards the production of a required outcome. This engages them in negotiation of meaning and language use that can lead to learning.

The Open University of Catalonia (UOC), an entirely online distance university based in Barcelona (Spain), addressed these aforementioned issues in its School of Languages through two innovative online applications, developed within the framework of the SpeakApps project, a European project funded with the support of the Lifelong Learning Programme of the European Commission. These applications are LANGblog and Tandem and reflect the distinction between oral production and speaking interaction made by CEFR to assess the improvement of students' oral skills. The former is an online videoblog thought for asynchronous online tuition in online classrooms and for practicing oral production; the latter is designed for distributing real content in real time in synchronous modalities and for

practicing speaking interaction. The following studies will present the application of these tools to the UOC's School of languages.

### ***First study – LANGblog***

When the UOC first started offering language courses, interaction in the classrooms and group work was mainly written, and oral production work was restricted to a cumbersome exchange of audio files attached to e-mails which did not facilitate interaction amongst students and was very time-consuming for teachers. New web 2.0 tools have opened new possibilities for the practice of oral skills outside the classroom, or within virtual classrooms. For instance, other tools that make it possible for students to make audio or video recordings and share them easily and in an inexpensive manner, are podcasts and Students Voice Blogging. However, podcasts have shown to be used much more for listening practice (Rosell-Aguilar, 2007) than for oral production practice (Vallance & Shibata, 2008) and Voice Blogging does not have an easy interface since each student has its own blog and not a wide audience. LANGblog was born in this context. It uses blogging technology with the purpose of having an easier interface for what would conceptually be a voice forum. It enables easy online audio/video recording and listening to teacher and students, directly on the tool. All postings remain accessible to listen and comment. Upload of pre-recorded audio / video files is also possible, and postings can use a combination of text, audio / video and image. Easy download of files is also possible.

This first study (Appel & Borges, 2012) presents the use of the tool LANGblog by teachers in the UOC since its introduction to the first UOC language classrooms in 2008 and its gradual integration to all language classrooms up to the 2011spring term when the study was carried out. The objectives of this study were:

- to know what LANGblog is actually used for in UOC language courses,
- to find out about patterns in the use of media (video, audio and text) in that tool,
- to compare teachers' and students' perceptions.

The research took into account the voices of task designers, language teacher and students in the School of Languages, where LANGblog is used as part of the course for the practice of oral skills, including CEFR levels A and B in English and French, and level A for Chinese, Japanese and German. Firstly, a focus group was submitted to designers to explore their viewpoints about the LANGblog tool, then a survey was addressed to online teachers to elicit their perceptions regarding the use of the tool. Finally, drawing on the results of focus group and questionnaire, another survey addressed to online students was created.

The analysis of the results brought to light some unexpected patterns of use of LANGblog and differences in the perception of the tools and tasks by teachers and students. The results of the survey also revealed that it is necessary to train teachers more extensively not only in the use of the tool from a technological point of view, but it is also necessary to train course designers and teachers in the pedagogical exploitation of the tool. This would be done with a view to foster the design of activities so that LANGblog can be used not only as a communication tool

for students, consolidating previously learnt language, but also as a teaching tool for the introduction of new content/language elements. Another issue that arises from this study is the need for reconceptualising how, when and how much feedback teachers can give as new tools facilitate student participation and increase the amount of language produced and recorded in the virtual classroom. With the emergence of web 2.0 communication tools the need for technological tools that can support and facilitate teacher and peer-to-peer feedback is pressing.

### ***Second study – Tandem Tasks in Skype***

The second study (Appel, 2012) describes a tandem exchange experience between the Open University of Catalonia (UOC) in Spain and The Open University (OU) in UK in spring 2008 and between students of English and students of Spanish. The objective of this study was to identify the impact of affective factors on the execution of the task and the relation between anxiety and typology of task. The language level of all the students was B2. The students from the UOC and the students from the OU shared a Moodle class in order to access the online material (translated into both languages) and in order to find peers to interact with synchronously. Students employed Skype for synchronous communication and PowerGramo ([www.powergramo.com](http://www.powergramo.com)) to record their tandem tasks. In the first task, students had to reply a few open-ended questions to break the ice. The second task was a spot the difference task. Data were gathered through pre-questionnaires, recording files, forum entries and post-questionnaires.

Data revealed that Skype was considered by students an easy tool to use and did not prove to be a source of stress. It also emerged that students' level of anxiety was attributed to the fact they had to deal with an unknown language partner in the L2. The results reported higher level of stress before starting the tasks and during the performance of the first task. It seems that students perceived the open-ended questions as more anxiety-inducing because they had to reply personal questions. Instead, when carrying out the spot the difference tasks, they felt more comfortable and perceived that they were achieving a reward. The most negative result was related to how they perceived their progress in the TL. Only half of the students did mention that they perceived to have improved their language level thanks to the task. This was probably due to the fact that only one task was compulsory. However, the general response of students to these tandem tasks was positive and many of them were willing to repeat the experience.

These results led to the conclusion that more controlled and paced tasks generate less anxiety among students, that tasks are all compulsory and that all students in the same conditions, since the participation of the students from the OU was totally voluntary unlikely the participation of the students from the UOC. This reciprocity aspect is at the bases of tandem partnerships.

### ***Third study – Tandem Tool & Interface Design***

The third study (Appel et al., 2012) presents the Tandem tool. Here students belonged to the same EFL subject of level B2.1 in the CEFR, a compulsory subject for their college degree. Their average age was between 26 and 55 and they were all native speakers of Spanish. For this study, students worked in pairs, communicated using Skype in order to carry out a number of speaking interaction tasks (spot-the-difference and ranking tasks) and made recordings of the conversations. They were divided into 3 groups. In one of the groups students accessed the materials on a standard html format, the second group used the tandem tool which distributes the materials in real-time and the third group used a variation of the tandem tool interface with confirmation buttons providing a scaffold to the conversation.

The focus of the study was examining what skills, learning strategies and type of language are used for each format in order to inform decisions related to the inclusion of these tasks at different points of the course syllabus, or even considering whether these tasks are more appropriate for different levels of proficiency. Data was gathered from a post-questionnaire which was sent to students in all three groups, the recordings of student performance, teacher interviews and entries made to support blogs.

Findings show that there is a clear difference between student performance using the html format materials and the tandem tool showing a startling difference in naturalness and spontaneous use of L2. This was an expected result since we had evidence students were looking at the materials and preparing beforehand, and the survey results confirmed this with over 60% of the students reporting they had done so. Students also reported being more nervous when working with the tandem tool than with the html format materials. This is also an expected result since the HTML format allows the students to prepare beforehand whereas the Tandem tool requires a certain degree of improvisation and spontaneity which put additional pressure on students. In relation to the difference between the interfaces in the tandem tool with confirmation buttons for each identified difference, these buttons are helped students structure the conversation and led the students to spend more time on the task.

### ***Fourth study – Tandem Tool Individually and in Pairs***

Finally, the fourth study (Grañena & Appel, work in progress) compares learning gains after doing a jigsaw task individually via an online handout and in pairs via Tandem. The task format was developed according to English B1 students' needs and proficiency level and focused on three problematic areas for learners of English: modal verbs, past tense, and connectors. The preliminary results showed that, although the task will be the same for individual students and for pairs of students, the interactional processes that take place in Tandem promote greater L2 learning. As a result, the learners that complete the task via Tandem will show greater pre-to-post learning gains on a cloze test administered before and after the task than learners that complete the task individually.

## Conclusion

From the analysis of these studies, it emerged that the LANGblog and Tandem, developed in the framework of the SpeakApps project, are valuable tools to engage students in the practice of their oral skills, which is still a challenge in language education whether it is online or not. However it is important to find a way of managing these tools efficiently within a classroom situation and to embed these oral activities within pedagogical tasks that will make the most out of their language learning potential. Task design is key to providing appropriate contents for Computer-mediated Communication in an L2 language learning context. In order to optimize communication and learning in foreign language contexts, it is crucial to develop language tasks that (i) create authentic communicative contexts for learners and (ii) promote the use of structures that are typically problematic for learners. The SpeakApps tools so far have proved to work efficiently if used synergically with a task-based approach.

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## **VISION, SCENARIOS, INSIGHTS AND RECOMMENDATIONS ON HOW ICT MAY HELP MAKING LIFELONG LEARNING A REALITY FOR ALL – THE STAKEHOLDERS' VOICE**

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### **Background**

VISIR – Vision, Scenarios, Insights and Recommendations on how ICT may help making lifelong learning a reality for all is a three year EU-LLP-KA3 project finishing this year<sup>1</sup>.

The rationale of the project is that whilst the use of ICT for learning in Europe is gaining ground, in order to uncap its potential 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, seven European networks and two research centres<sup>2</sup> have joined forces to address three major gaps: the 'understanding gap', the 'networking gap', and the 'mainstreaming gap' of ICT for learning in Europe. By working to close these gaps, VISIR supports the leap towards the meaningful and widespread use of new technologies in learning.

The project works on three levels of analysis and action: the macro level (education and training systems), the meso level (organisations providing teaching and learning) and the micro level (teaching and learning opportunities themselves).

VISIR had the following objectives:

- To provide a long-term vision on the contribution of ICT for transforming education and training systems in line with the needs of the future European knowledge society.
- To guarantee stakeholders' involvement and engagement in the development and validation of such a vision through cross-sectoral stakeholders consultations among ICT-for-learning experts, practitioners and decision makers.

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<sup>1</sup> [visir-network.eu](http://visir-network.eu)

<sup>2</sup> MENON Network ([www.menon.org](http://www.menon.org)), European Association for Adult Learning – EADL ([www.eadl.org](http://www.eadl.org)), European Distance and E-learning Network – EDEN ([www.eden-online.org](http://www.eden-online.org)), European Foundation for Management Development – EFMD ([www.efmd.org](http://www.efmd.org)), European Learning Industry Group – ELIG ([www.elig.org](http://www.elig.org)), European Interest Group on Creativity and Innovation – EICI ([www.creativity-innovation.eu](http://www.creativity-innovation.eu)), European Foundation for Quality in e-Learning – EFQUEL ([www.efquel.org](http://www.efquel.org)), K.U. Leuven ([www.kuleuven.be](http://www.kuleuven.be))

- To facilitate the emergence of grassroots ICT-for-learning-innovation by identifying at least 100 successful micro-innovation practices and to catalogue them according to transversal issues.
- To facilitate exchange of ideas and emergence of insights around these practices through the organisation of transnational seminars focusing on specific dimensions of innovation such as assessment, quality, students involvement, economics of education, of ICT-for-learning.
- To mainstream innovation by promoting these 'practices that work' both towards E&T policy makers and towards ICT-for-learning communities, through web dissemination among the participating networks (with reach of 1600 institutions and 24,000 professionals and practitioners) and two mainstreaming international events.
- To provide recommendations and guidelines for policy and practice on how to contribute to closing the understanding, networking and mainstreaming gaps that hinder the meaningful exploitation of ICT in European Lifelong Learning.

During its lifetime (2011-14), 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 existing 'domains of change'. Four comprehensive online stakeholders consultations were organized. A system was set up for collection and display of grassroots ICT-for-learning innovation, with more than 120 successful micro-innovation practices identified and the 23 best practices selected.

Three transnational exchange seminars were organized, on the issues of e-assessment, learning and the future workplace, and learning innovation for regional development. VISIR has also organised two Mainstreaming Seminars in 2013-2014 in collaboration with other projects working in the field of ICT for learning, in the Committee of the Regions in Brussels, engaging a range of stakeholders, from policy makers to researchers and grassroots innovators.

## **The Stakeholders' Consultations**

The present paper gives an outline about the process and results of the VISIR Stakeholders' Consultations. Their aim was to involve stakeholders with gathering relevant and up-to-date information, facts and ideas, supported by stimulating discussions on the contribution of ICT for learning to digital and key skills acquisition in Europe.

The concept of the consultations was to cover the following strategic topics:

*“LLL in the XXI Century: dimensions of change” – “Reacting to change and transforming European LLL: the contribution of ICT” – “Towards an innovative ecosystem for European Lifelong learning: the contribution of ICT” – “Driving the change together: the importance of involving stakeholders in a sustainable perspective”.*

## **Vision, Scenarios, Insights and Recommendations on How ICT may Help Making Lifelong Learning a Reality for All – The Stakeholders' Voice**

*András Szűcs, Livia Turzó*

The four consultations were focused on the following themes

- First consultation:  
Identify and analyse the trends on ICT and learning in Europe.
- Second consultation:  
The contribution of ICT to effectiveness of learning, to the transferability of learning outcomes, the employability value of education, to new assessment methods and to the attractiveness of learning
- Third consultation:  
What may promote or discourage changes towards innovation friendly learning systems recognising grassroots innovations
- Fourth Consultation:  
What actions should be taken to boost and scale e-learning Micro Innovation in Europe?

Survey participants were asked to give their comments on statements, recommendations and questions e.g.: trends analysis, micro innovation practices identification and evaluation, networking and practices exchange.

The **target group** was wide, including stakeholders from all education sectors: Policy makers (EU and national level, in education related fields), Educational professionals (teachers, professors, ICT professionals (practitioners and business providers), Researchers and Networks and initiatives in diverse education and training fields.

## **Methodology**

The European associations in the VISIR consortium mobilized their members and partners, the whole network of connections as pools of stakeholders to participate in the online consultations. Structured communication plans have supported the promotion activities to recruit the participants in email and web campaigns. The number of people reached varied between 20-30,000.

The four consultations were running six weeks each: June – July 2012, March – April 2013, December 2013 – January 2014 and June-July 2014. In five languages: English, German, French, Spanish and Italian was possible to take part in the online surveys.

The digital tool used for the first survey was Userve (www.uservice.com). It is structured around users providing ideas on a certain topic with giving room for comments and allowing each user to allocate 15 votes among the ideas. This format engages people and provides a dynamic form that changes in line with the respondents answering the questions, e.g.: the questions/statements changing their sequences as the respondents add their priorities.

The online tool used for the further surveys was SurveyMonkey (www.surveymonkey.com).

The project partnership elaborated several policy statements and provided different options for each statement, regarding how ICT can contribute to achieve them. Participants were invited to vote on the options and they could submit their own proposals as well about additional/alternative options on the themes. It was also possible to comment and raise further related issues about developments with the support of ICT.

Questions were also asked on to the profile of the participants: their background, education sector involvement and their attitude towards innovation.

### **Participants**

Clearly, the consultation has reached a community with effective practice, experience, motivations in learning innovation with strong commitment and good understanding of the scene.

The significant number of responses received to the survey, their diversity and the deepness of the comments showed that the consultation has reached its goals, the importance of the topics raised was proven. Stakeholders seemed to be active, interested and informed about the contribution of ICT in addressing key concerns related to learning innovation.

The contact list of 400+ stakeholders who signed-up to receive regularly results and related news about the research and the project shows the positive impact and effectiveness of the consultations, proving that they appreciate to have their voice heard and be involved in fostering innovations.

During the third consultation, an extra question was asked about whether respondents would consider themselves as innovators in education. The attitude and personal motivation of teachers to become innovative actors seems as most significant reason why they consider themselves 'innovative'. Service oriented culture in the institutions is also an important enabler. Innovation is understood often as a process: with theory and practice, experimenting – implementing – evaluating the application of ICT tools. Quite a few respondents mentioned that they are not only using the new methods in their activities but also do research and experimentation in the field, analyzing the results of non-conventional practices.

Table 1:

	<b>No of Participants</b>			
	<b>1st</b>	<b>2nd</b>	<b>3rd</b>	<b>4th</b>
EN	160	154	242	177
DE	20	23	19	6
IT	10	23	29	5
ES	15	10	25	5
FR	7	19	11	7
<b>SUM</b>	<b>212</b>	<b>229</b>	<b>326</b>	<b>200</b>

## Vision, Scenarios, Insights and Recommendations on How ICT may Help Making Lifelong Learning a Reality for All – The Stakeholders' Voice

András Szűcs, Livia Turzó

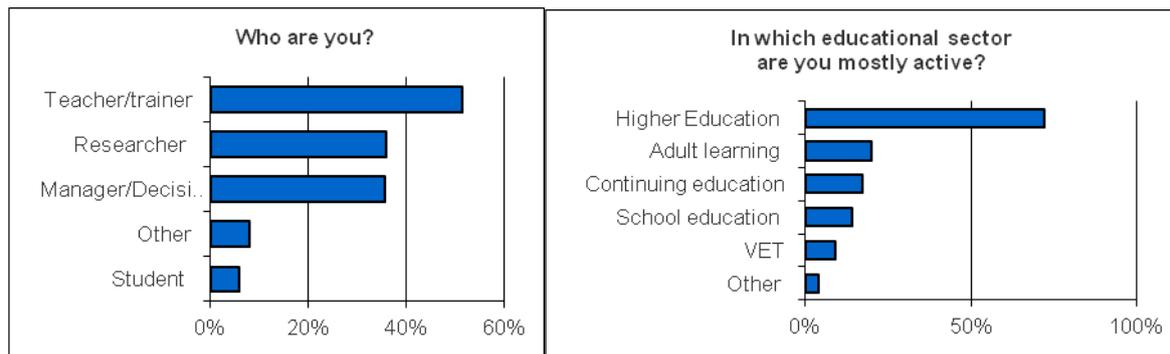


Figure 1.

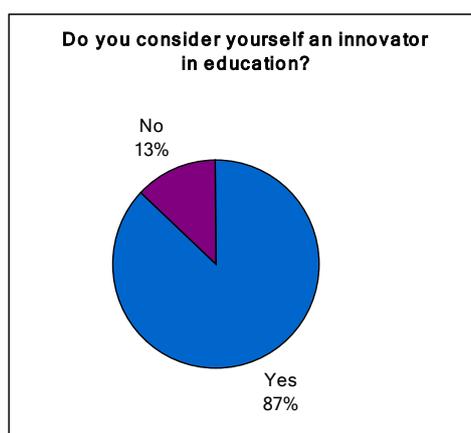


Figure 2.

## Key findings of the consultations

### Policy and socio-economic aspects

1. Growing attention prevails to the relationships between **learning, living and society**, to the **notions of learner and citizen** and the attention to **learning communities and learning worlds as extending beyond education, becoming** engines of active citizenship, social participation, innovation and individual development.
2. Strengthening the societal-educational perspective of the **content** of education (*problems like environment, eco-systems, moral and ethics*) as well as to the **way learning is organized in learning communities & spaces** (*intergenerational, cross cultural, cross-borders and interest-based learning*).
3. Regarding the role of **policy and the macro-level institutions** to boost and scale micro-innovation, **comprehensive action is awaited from the EU**, which has been in fact in the past as well the main policy development and practice improvement support background.

The anticipated leading role of the EU indicates that **the promotion of the innovation movement requires conceptual-strategic approach and sustainable operative action.**

4. Most national structures did not perform very well, thus understandably less expected to become engines of micro innovation.
5. **Overall learning in society** was highlighted as the real patrimony in which to invest, reflecting the need to enlarge the perspective of actions beyond the education systems.
  - a. Holistic approach – Integration, collaboration, strategy - needed to realise the potential of ICTs.
  - b. Positive impact of the work-based, workplace related learning, and „real-life situation embedded” instruction, the need of bringing real-world applications and experts in the classroom.
6. Less interest was shown to institutional change in educational systems, which is be expected to be slower anyway (School autonomy, Decentralization of curricula, ICT supporting more equality).

### ***Methodology, pedagogy, research***

1. Innovation is identified as important tool to motivate the students, enhance learning experience and develop their full potential.
2. Better understanding and proper use of the existing tools is recommended - rather than new paradigms or concepts:
  - a. Functional rationalisation, flexibility, increased economic (cost and resource) awareness, quality and assessment and legislation/accreditation issues
  - b. Well organized environment, preparedness to manage cost implications and legal issues
3. The technology background enhancement is not really a core issue at most institutions, in accordance with the belief that the powerful IT tools available can ensure the efficient functioning, thus we cannot speak nowadays about bottleneck in technical terms.
4. Openness and interest of respondents to the emerging practices **in new assessment methods using ICTs**: instruments for the integration of informal learning, media testing of learning outcomes, ICT use in social-collaborative open assessment forms.
5. ICT is contributing to the collaborative aspects **and the scalability of innovation in learning** by sharing experience, peer collaboration, networking of students and families.
6. An important **barrier** is the **competence** of teachers and trainers, together with lack of appropriate methodology.
7. The **importance of research** was widely highlighted.
  - a. Need for **evidence of the usefulness** of innovative methods and research has an important role.

- b. **Innovators themselves can enhance the impact** of their achievements by deeper, justified **interpretation and presentation of the results**.
8. The significance of **sharing knowledge and networking** was emphasized: innovators should have access to resources for networking, sharing of practices and for promotion of innovation accelerators.
9. The expectations regarding radical **changes in the funding mechanisms and paths** are not overwhelming. Crowd funding, open approaches, Open Educational Resources are in the public speech and media high on the agenda but did not receive great confidence as new convincing tools to bring micro innovation substantially in motion.
10. **On employability value of education:** bringing closer the world of work to education received support. ICTs contribute to the development of transversal-horizontal and soft skills (communication, critical thinking, collaboration, etc.) and promotion of entrepreneurship which is valued by the employers.
11. For the comprehensive, larger scale models for the **involvement of learners, students in the innovation efforts**, the environment is according to the respondents apparently not yet mature enough.
12. Some scepticism regarding the potential of ICTs: the expected learning enhancements exist in traditional environments as well, not inevitably linked to the ICT use. NB: a kind of impatient approach – when ICT will be in education and training finally properly implemented...?

### ***Institutional level – Reward and recognition***

1. The role of the institutional management in innovation is important factor.
  - a. **Solid pedagogical vision and ICT strategy** is expected to be communicated by leaders.
  - b. Awareness among institution leaders on the necessity of innovation and an open-minded, flexible organization culture with motivation towards innovative teachers is necessary for innovators.
  - c. Flexibility in the curriculum and timetables in schools is also important and more evidence of effectiveness of using ICT in education is requested.
2. Regarding how to boost and scale e-learning by **institutional leaders**, the since long time addressed **lack of reward and recognition** has been strongly reiterated. **Increasing pressure and workload on teachers** by assigning to them **additional (innovation) management duties** seems hardly possible.
3. One reason for the limited support of learning innovation among the teaching staff is that the acceptance of further obligations is limited. The **bottlenecks of time and capacities** of teachers working with innovations and lack of funds for content development was here indicated in spite of opportunities opened by the enhanced social web and open approaches.

4. Institutional recognition, paying respect to innovation performance and career advancements for innovators rewarding successful innovation was found important: when teachers can see the added value and feel their responsibility that may become important motivational factor.

## **Conclusions**

During the 3-year work of VISIR (2011 – 2014), four Stakeholders' Consultations have been carried out in order to involve professionals and practitioners as well as decision makers, students, civil society representatives, to build on their opinion and experience, to develop a common vision on how ICT may help making lifelong learning a reality.

In order to acquire digital and transversal competences and exploit the new technologies fully in learning, an “understanding gap” a “networking gap” and a “mainstreaming gap” should be closed.

From the results of the consultations, we can notice as directions for progress and further actions:

### ***Re the networking gap:***

- ICT is contributing to the collaborative aspects and the scalability of innovation in learning by sharing experience, peer collaboration, networking of students and families.
- Attention to learning communities as extending beyond education, becoming engines of active citizenship, social participation, innovation and individual development. Overall learning in society is the real patrimony of innovation.
- The way how learning is organized in learning communities and spaces may be instrumental: e.g. intergenerational, cross cultural, cross-borders and interest-based learning settings.
- For valorisation of innovation, sharing knowledge and networking is necessary. Innovators should have access to resources for networking, sharing of practices and for promotion of innovation accelerators.

### ***Re the understanding gap:***

- Innovation is an important tool to motivate students, enhance learning experience and develop their full potential.
- ICTs contribute to the development of transversal-horizontal and soft skills (communication, critical thinking, collaboration, etc.) and promotion of entrepreneurship
- Better understanding and proper use of the existing tools is recommended - rather than new paradigms or concepts: Well organized environment, flexibility, increased cost and resource awareness, attention to quality, assessment and legislation/accreditation issues

## **Vision, Scenarios, Insights and Recommendations on How ICT may Help Making Lifelong Learning a Reality for All – The Stakeholders' Voice**

*András Szűcs, Livia Turzó*

- Technology infrastructure enhancement is not core issue as bottleneck.

### ***Re the mainstreaming gap:***

- Holistic approach – Integration, collaboration, strategy – better understanding of relationships between learning, living and society needed to realise the potential of ICTs.
- to boost and scale micro-innovation, comprehensive action is awaited from the EU, as the innovation movement requires conceptual-strategic approach and sustainable operative action.
- Positive impact of the work-based, workplace related learning, and „real-life situation embedded” instruction, the need of bringing real-world applications and experts in the classroom.
- An important barrier is the competence of teachers and trainers, together with lack of appropriate methodology,
- Need for evidence of the usefulness of innovative methods and research, justified interpretation and presentation of the results
- Role of leaders: solid pedagogical vision and ICT strategy needed at institutions, with open-minded, flexible organization culture and motivation towards innovative teachers.
- lack of reward and recognition, paying respect to innovation performance is long standing unsolved question

The results provide good basis to formulate specific and conceptual recommendations by the VISIR Consortium, outlining and encouraging further developments in ICT-supported lifelong learning.

**Vision, Scenarios, Insights and Recommendations on How ICT may Help Making Lifelong Learning a Reality for All – The Stakeholders' Voice**

*András Szűcs, Livia Turzó*

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## **PATTERNS OF NON-ENCOURAGED IN-CLASS MOBILE TECHNOLOGIES USE AT BUDAPEST UNIVERSITY OF TECHNOLOGY AND ECONOMICS (BME)**

*Judit Vidékiné Reményi, Budapest University of Technology and Economics, Hungary*

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### **Abstract**

Although mobile technologies have been revolutionizing the classrooms globally, not much has happened in the field of integrating them into university classrooms in Hungary. A research – surveying the patterns of non-encouraged in-class mobile technologies (MT) use at the Department of Technical Education, Budapest University of Technologies and Economics – focuses on what characterizes Hungarian students' in-class use of MT compared to their foreign peers studying at the University. This can help faculty members to initiate innovations by designing and introducing appropriate new methodologies and activities for in-class use of MT.

### **Introduction**

In Hungary, the use of mobile technologies and mobile internet access has become a mainstream feature of business, work and social contexts due to decreasing equipment prices, enhanced popularity, increasing volume and improving quality of digital content. Educational institutions are considering their uses, due to – among others – the growing social demand for quality educational services, although integration into learning and in particular, personalization it is far from reality as yet. Literature shows that educators worldwide “have considered harnessing these devices within and beyond the classroom” (Mueller et al., 2012) as they are transforming young people's learning habits and related expectations as well. Nevertheless, Hungarian higher educational institutions tend to be still failing to recognize the urgent demand for thorough changes.

The goal of the research at the Department of Technical Education is to find out the pattern of non-encouraged in-class mobile technologies (MT) use in order that faculty members could rethink their methodologies and their assumptions about learning in a technology driven environment and enable individualized and more productive learning by means of integrating MT.

## **The present MT use related situation at BME**

The learning environment of higher education in Hungary can still be characterized by the one-size-fits-all traditional approach of top-down, often authoritative, one-to-one lecture drive content transfer. In other words, although digital technologies have been fast changing the way we learn, they do not change the way how students are taught at Hungarian universities. Despite the kind of conservative approach of many BME faculty members, they observe that the majority of the students bring their own mobile devices and use them during classes even if that is often discouraged or even forbidden. That is, mobile media consumption is becoming mainstream at the University, although, as experience suggests the use of MT is less frequent for taking notes in the classroom than for other purposes. It implies a considerable pedagogical challenge for the faculty such as how to avoid the distracting effects of in-class digital media use or how to avoid the destructive effect of in-class social media use. Furthermore, it raises serious pedagogical issues such as that of balance between fun and hard work in learning, that of digital technologies related skill development instead of content provision, that of enabling collaborative learning and performance assessment instead of individualized solutions etc. There seems to be a relationship between the students' digital learning skills and the faculty's suggested use of digital technologies. Digital technology based new modes of learning are however not yet a reality at the University (and the situation is similar at other Hungarian universities as well).

Although it is widely recognized – by faculty members also – that mobile technology has great potential for educational use, the following approach is still “mainstream”:

*“A university classroom. The instructor is reading aloud from a passage in the assigned work for the week. He looks up to find his students all deeply engrossed. Their rapture, alas, is not with him but with their laptop screens, their attention worlds away.*

*Later that day, the professor fires off an email to his colleagues suggesting that laptops be banned from the classroom because of incidents like this.”*  
(Davidson & Goldberg, 2010)

BME faculty members tend to have three strategies concerning the use of mobile technology, more or less similarly to their colleagues' strategies worldwide:

- Encouraging the use of MT. Having recognized the educational potentials of mobile technology and its prominence in the students' life, the followers of this strategy not only encourage the use, but also devise plans how to integrate the use of mobile technology into mainstream education to make incentive, collaborative, participatory learning reality. It should be noted that the encouraged use should be based on preplanned pedagogical activities directing student attention on coursework related issues.

- Restricting the use of MT. Although it is a fact that students are far from paying full attention to the lectures, they are repeatedly engaged in some other activities such as googling, reading, etc. Digital technology is seen to compete with faculty for the students' attention thus is considered to be a major distracter. Frequently switching their attention back and forth – from listening to a lecture to using their MT for some non-class related activities can result in poor learning. In this case the fact that students' behaviour and expectations have much changed is not properly taken into consideration.

As at present there is no commonly agreed theory of how to best use mobile devices to customize learning, faculty members will need to experiment with innovative solutions, appropriate for the nature of the course. It is obvious that it is a long way until we will be able to avoid the traps of misuse resulting in adverse effects.

- Tolerating the use of MT. Since most faculty members might belong to this category, for different reasons such as recognizing the educational potential of digital technology but not knowing how to harness it, or lacking the stamina to restrict the use, maybe not wanting to lose their popularity etc. It is necessary to persuade them to change their strategies and utilize MT for their own interest and for their students' benefit.

At the University there is no explicit policy on the in-class use of mobile technology except for phoning in-class and the use of MT in examinations which is prohibited. Most faculty members tolerate their use, but it disturbs them, e.g. because of the distraction of attention. Once MT have reached the higher educational institutions, instead of restricting or tolerating their use, we should encourage and integrate them in the classrooms. However, it takes a long way to change approaches and strategies and use them confidently and efficiently. At present it seems that this kind of innovation and experimentation is not being fuelled. Still, inspirations may come from the faculty's lower satisfaction with their own pedagogical performance.

## **The research**

The research is carried out at the Department of Technical Education, BME. The Department provides MA courses for engineer-teachers and economist-teachers and also numerous part-time postgraduate courses for teachers. As a faculty member I have gained invaluable first-hand experience of students' in-class MT use. Since my average "classroom size" varies from 12 to 50, I am able to pay attention to my students' non-classwork related activities. Since I have courses for foreign students, I also have an opportunity to compare their patterns with those of Hungarian students. The observations and the urgent need for changing our strategies and methodologies have led me to design and start the research.

The goal of the research is to find out whether there are dominant patterns of in-class mobile technology use at BME, that is:

- What mobile devices students use,

- How often they tend to use MT in ninety-minute classes, that is whether they are light or heavy media users, and
- What purposes they use MT for.

International survey findings provide some information on the global situation; however, there are considerable differences among nations due to their characteristics and differences of cultures.

The differences concern – among others – the way how often Hungarians tend to use their MT, what they use them for, their authority respect etc. What is evident is that Hungarians are “talkers”, tending to discuss anything in public aloud. Furthermore, Hungarian youngsters tend to obsessively use social media to have their own voice, to be “insiders” in a community and follow strong communication-related patterns. A recent Hungarian survey has found that 83% of the respondents (1,000 persons) use social sites. Another Hungarian survey reports that the number of Facebook users increased by half a million in a year and totalled in three millions. My experience suggests that Hungarian students respect authority more than foreign peers, as non-encouraged in-class use of MT in the first (few) week(s) of the course is not characteristic for Hungarian students.

The hypotheses of the research are:

- The great majority of the students at BME bring MT into class.
- Students at BME use their MT several times in class in a non-encouraged way.
- Students at BME use the MT for non-academic purposes more often than for academic purposes in class.
- The majority of the faculty members at BME do not encourage the in-class use of MT.

## **The stages of the research**

The stages of the research are:

- Surveying Hungarian and international students doing different courses at the University by using a short questionnaire of close questions (See below.).
- Interviewing teachers about their readiness to integrate mobile technology into their classes.
- Analysis of the results and producing recommendations concerning the optimum in-class use of MT.

## **Preliminary results of the survey**

The survey of students started in May 2014 and is still in progress. First results suggest that:

- The use of smart phones can be considered general, while iPads, e-Readers, tablets are used sporadically. Foreign students seem to be better equipped with MT than their

Hungarian peers. The enhanced affordability will certainly increase the rate, consequently we need to prepare for the general use.

- Almost as many respondents use mobile technology (MT) for academic purposes as for non-academic purposes in class. Those who report using MT for academic purposes use it for checking online dictionaries (foreign students, Hungarian students doing a course in foreign language or studying foreign language), checking course related information (such as course requirements, deadlines etc.), accessing outside resources, taking notes, taking photos and recording. However, almost half of the respondents report using MT for reading and writing text messages and using social networking websites. The increasing volume and the improving quality of online information may further encourage the non-encouraged in-class use. At the same time social changes might further increase the importance of “staying connected to a social site”. Consequently the use of MT for non-academic purposes will also increase.
- The respondents use MT at least 1-3 times during a ninety-minute class, but almost as many respondents report that they use them 4-8 times. MT frequency of use indicators will obviously not decrease or stagnate, so we either can devise “checking-in”, “sharing location” related pedagogical activities or need to get used to this kind of distraction.
- A great majority of the respondents report that they think MT will change education. This should be well understood and become common goal of faculty members. However, it should preferably be supported by findings on in-class use patterns related surveys and systematic planning and design.

## **Conclusion**

As the preliminary results show that the majority of the students bring their own MT devices and use them in class, it is obviously necessary to experiment with innovative approaches to integrate the use into traditional lectures as well. No doubt (as surveys and experience suggest), the in-class use of mobile devices in lectures may increase interactivity, and the different ways of in-class use of mobile devices allow for a personalized educational experience. Furthermore, the encouraged in-class use of MT – leading the students to reach sooner digital media consumption saturation point (global survey findings suggest that our digital media consumption is increasing) – can have a positive effect on student attention, consequently on learning. The mode and frequency of the use can be defined after the survey has been finished and the results analysed, since the mainstream patterns of non-encouraged in-class usage should be considered when designing tomorrow’s university education at BME.

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## Appendix

### **IN-CLASS MOBILE TECHNOLOGIES USE SURVEY**

Tick the most appropriate answers. (You may tick several answers.) Thank you for your help.

Your age:                      18-25:                       26-30:                       31-40:                       41-50:                       51-65:

Your nationality:

1. What personal mobile device do you always have on you in the classroom?

None:                       Mobile phone:                       Smartphone:                       Tablet/iPad:                       Other:

2. What purposes do you normally use your mobile device in the classroom for?

(You may tick several answers.)

I don't use it in the classroom.

For academic purposes / schoolwork.

For non-academic purposes / for personal reasons.

For accessing course materials.

For accessing outside resources.

For checking course related information.

For taking notes.

For language support (e.g. using online dictionaries).

For texting.

For using social networking websites.

For recording.

For photo taking.

Other: .....

3. How often do you normally use your mobile device during a 90 minute class on average?

1-3 times:  4-8 times:  9-12 times:

4. Do your teachers encourage you to use your mobile device during a 90 minute class?

Never:                       Occasionally:                       Frequently:

5. Does the University / Faculty allow, selectively allow, or prohibit mobile device usage during instructional time?

It allows:                       It selectively allows:                       It prohibits:                       It depends:

6. Do you think mobile technology will change education?

Yes:                       No:                       I don't know.:

Thank you for your help.

Department of Technical Education BME



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## **FROM LIBRARY PLACE TO LIBRARY SPACE: INVESTIGATING DISTANCE LEARNER ENGAGEMENT WITH ONLINE LIBRARY SERVICES**

*Jacqueline Baxter, Megan Doolittle, Non Scantlebury, Sam Thomas, The Open University,  
United Kingdom*

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### **What elements of Online Library Services are perceived to be of greatest value to distance learners in their scholarship development and employability?**

This scholarship research project is investigating distance learner engagement with online Library Services. The project specifically explores elements of learner engagement and potential pedagogic and employability value in providing digital library content and services to distance learners studying Social Sciences Qualifications at The Open University.

### **How might newly emerging pedagogies for delivering online distance learning impact on student engagement with Online Library Services?**

This research explores student understanding of the ways in which use of an online library contributes to their skills and employability over the course of their studies. In so doing, it looks to understand the part played by online library services in supporting learning development and newly emerging pedagogies for online distance learning.

Quantitative and qualitative methods were used in order to derive evidence. Online questionnaires and telephone interviews were undertaken with cohorts of Levels 1 and 2 students studying three qualifications. The research seeks to explore the following questions:

1. How do students at each level within their qualification expect to engage with online library services?
2. What do students understand by online library services?
3. What employability skills do students think they will be equipped with after using online library services as part of their qualification?
4. What patterns of online library usage are discernible at each stage of the qualification and what insights do these offer?

5. How do students understand digital literacy as pedagogy? For example, is it just an “add-on” or do they understand it as integral to knowledge and skills that they build up over the course of a qualification.

### **What factors and drivers might influence increased engagement with Online Library Services?**

The work builds on previous research in the field, particularly relating to indicators that online digital literacy is a key factor within student retention and success (Fini, 2009) and using additional evidence provided by ‘library analytics’, (Stone & Ramsden, 2013) a newly emerging field of study. Initial analysis of the data indicates that student expectations and understandings of both the online library and the ways in which it contributes to their skills and employability are influencing the ways in which they perceive their online learning experience, offering new insights into their journey towards independent learning.

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## **ASSESSMENT STRATEGY – DESIGNING AND DEVELOPING ASSESSMENTS FOR ONLINE DISTANCE EDUCATION**

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### **Introduction**

Assessment has the potential to be a driving pedagogically instrument in third level education. The function of assessment should not merely be to measure learning, it should be an occasion for students to engage with and develop their learning. Successfully engaging in the assessment process is an opportunity for students to achieve and demonstrate key knowledge, skills and competencies.

In 2012, a project with the aim of improving the quality of assessment writing in an online Bachelor of Arts (Hons) in Humanities Programme began with the development of a guide for designing and writing assessments for online distance education students. In 2013, an audit of the programme's learning outcomes and their inherent assessment types was conducted, with some deficiencies being identified. The appropriate assessment types required to provide students with reasonable opportunities to achieve the programme's learning outcomes, as well as each module's learning outcomes, were identified. This resulted in the creation of an assessment matrix, which involved a structured and transparent programme-level plan for the assessments across all modules within this flexible modular programme, where students may take a number of different progression routes. Prior to the introduction of the assessment matrix, while some variety in assessment type was evident, the choice of assessment depended on decisions made by individual assessment writers, and often tended to rely on the essay-style assessments and the end-of-year examination. A need for training of assessment writers was identified and in 2014 an online assessment writing course was developed and associated training workshops delivered.

This poster will present the process involved in: the creation of the guide for writing assessments; identification of the appropriate assessment types for the achievement of learning outcomes; the development of the assessment matrix and; the on-going development of an online assessment writing course and training workshops. The paper also details the lessons learned from the project thus far and outlines our plans for the project.

## **Background of the Open Education Unit**

The Open Education Unit (formerly Oscail), the main provider of online, ‘off-campus’ programmes in Dublin City University (DCU), was established in 1982 as the National Distance Education Centre (NDEC). This Unit has seen many changes since its establishment in 1982, including a full transformation from being a separate organization, working in conjunction with a number of Irish universities, to being the main provider of online distance education programmes for DCU. The Open Education Unit is now located within DCU’s National Institute for Digital Learning (NIDL).

By providing online, ‘off-campus’ programmes, the Open Education Unit has as its core mission the provision of programmes in order to provide students with the opportunity to attain their educational goals without being required to attend campus-based lectures/tutorials on a regularly basis.

A number of undergraduate programmes in a range of subjects from the Humanities and programmes in Information Technology are offered by the Open Education Unit. There are also postgraduate programmes, which are targeted specifically at students wishing to obtain management qualifications mainly in the areas of Clean Technologies, Operational Management, Internet Enterprise Systems, Information Systems Strategy and Management for Sustainable Development.

## **Structure of the Humanities Programme**

One of the challenges of this project was to ensure appropriate opportunities for students to achieve the stated programme learning outcomes while retaining the flexibility of its structure. The humanities programme is based on a modular structure with students being required to successfully complete twelve modules in order to graduate with a degree qualification.

The current offering of undergraduate humanities programmes includes the Bachelor of Arts in Humanities (Hons), the Bachelor of Arts in Humanities (Psychology Major) and the Bachelor of Arts in English and History. The focus of this poster is the Bachelor of Arts in Humanities (Hons) programme which consists of a suite of thirty (15 ECTS) modules from five subject areas: Psychology; Literature; History; Sociology and Philosophy.

While some restrictions are in place, the flexibility of module selection is a defining element of this programme and students are not required to follow a strict pathway through the programme. One of the underpinning principles of the degree is to enable students to select modules from a range of different disciplines. Therefore the pathway through the programme is deliberately designed to provide the maximum level of flexibility and choice for students.

## **Open Distance Education Staffing Model**

The Online Distance Education Teaching and Learning/Staffing Model, utilised by the Open Education Unit, is well-defined in its delineation of staff roles. The staffing model consists of a small number of full-time campus-based staff working with a range of externally-based academic staff from a variety of academic and industry backgrounds. While the full-time staff members execute a diverse range of functions and roles, all other members of the team have very specific and distinct tasks and duties. This peripheral network of people consists of academics contracted to complete certain tasks which typically involve part-time hourly-based work conducted over a period of time ranging from a number of weeks to a number of months (up to a full academic year). The roles undertaken by these part-time employees include ODE tutors, learning materials writers, assessment writers, learning materials editors, senior academics advisors, assignment monitors, internal examiners, external examiners and programme board members.

The staffing role which is central to this poster is that of the Assessment Writer. Appointments to this role are mainly awarded to academic staff from a variety of higher education institutions from the Republic of Ireland. An Assessment Writer is contracted to produce a set number of assignments including marking guidelines, feedback grids, end-of-year examination papers and marking guidelines for a particular module.

## **Programme Learning Outcomes and Learning Opportunities**

While online distance education programmes may differ in many aspects from the more traditional on-campus programmes, within the higher education system, both modes of delivery compare in their reliance on the Irish NFQ (National Framework of Qualifications) / learning outcomes system. The humanities programme is listed as level 8 (honours undergraduate degree-level) based on the NFQ categorisation of qualifications. Therefore, the language and level of the learning outcomes are aligned to that of a level 8 standard. The humanities modules are designed to have a progression from foundation to intermediate to advanced level modules and this progression is reflected in the related module learning outcomes. It is the learning outcomes that shape and guide the instruction and assessment of the humanities programmes. The constructive alignment of programme learning outcomes with assessment type was a critical first step in the design of the assessment strategy.

## **Development of the Assessment Matrix**

The assessment matrix was designed to ensure the appropriate usage and varieties of assessment types across the humanities programme, in order to ensure that students had reasonable opportunities to achieve the required knowledge, skills, and competencies as determined by the programme learning outcomes. This programmatic-level view has the

added advantage of safeguarding against the over-assessment of any particular programme learning outcome, and against the over-use of any particular assessment type.

Typically, the design and development of assessment will lie within the remit of a single module coordinator. However, here, the introduction of the assessment matrix saw a shift in the development of the assessment strategy from the individual lecturer to the programme team. In order to incorporate the appropriate assessment type, with the purpose of providing appropriate opportunities for students to achieve the programme learning outcomes, the programme team were required to prescribe particular assessment types in particular modules. This offset any over reliance on a particular assessment type and prevented a situation where a student could avoid engaging with the required learning opportunities. In addition, careful consideration was given to the alignment of module learning outcomes with the appropriate level and pitch of the module assessment.

The assessment matrix contains information pertaining to the type of assessment, the number of assessments, the weightings, the marking rubrics and the feedback format for all modules.

## **The “Creating Assessment for Online Distance Education Students” Document**

Prior to the development of the assessment matrix, a guide was created for writers of distance education assessment called “Creating Assessment for Online Distance Education Students”. This guide discussed constructive alignment, writing examination papers, different assessment types, writing marking guidelines and designing marking rubrics, scaffolding assessments, using open educational resources, sample assignment documentation and templates, assessment grading schemes, and examples of best practice. In 2014, this guide was converted into an online course and will be further expanded in 2015.

## **Introduction of Different Assessment Types**

The creation of the assessment matrix highlighted some deficiencies in the learning opportunities available to students in relation to a small number of programme learning outcomes. In 2013, the majority of these gaps were addressed through the introduction of a variety of different assessment types. The introduction of these assessment types exposed the need for training and support, for assessment writers, in the design and development of assessment documentation.

The appropriate design and development of assessment instructions, for students, is paramount to the positive experience of students with that assessment. Similarly, badly designed assessments can have a negative effect on the student experience. The design of digital assessment must be well structured, clearly written, comprehensive and unambiguous. Assessment instructions should provide students with an indication of what the assignment task is, how they should go about completing the task(s), and what criteria will be used to evaluate their work. This is especially beneficial to students who may have been out of

academia for a number of years or for those who are new to third level study. Appropriate and well-constructed evaluation criteria are important for students in order to inform their study and form the basis of the feedback which is provided by the lecturer. Providing students with the evaluation criteria, prior to assignment submission, can enhance the relevance of feedback.

In order to support writers, the existing assessment writing guide was converted into an online course within a virtual learning environment. With the introduction of a number of assessment types to the assessment strategy, the main development work undertaken was in the expansion of the resources relating to online assessment tools. These resources detail the benefits and pitfalls of each assessment types; outline the structure of assignment instructions documentation for students (sources to be use, aims and objectives, which programme learning outcome is being assessed, detailed guidelines, assessment weightings, evaluation criteria, format for submission, specific instructions relating to any digital technologies used); provide guidance on how to create assignment marking guidelines for lecturers; and supply sample assessment grading scheme/marking scheme/feedback grids. In 2013, the assessment instruction documentation was expanded to include information for students on how and what to upload for marking (including the number files, file format and naming convention for files); this section is referred to as “Deliverables”. Following a review of the 2013 assessment documentation, additional sections were added to the 2014 assessment documentation, namely, an “Evaluation Criteria” section, a “Plagiarism” section and a “Referencing” section. The evaluation criteria of each piece of assessment, is directly linked to the criteria on which the feedback is framed.

## **Future Plans**

In 2015, a number of the existing digital resources will be further developed. These resources will be specifically designed for assessment designers, in the development of assessment documentation, for assignments using collaborative digital tools such as wikis and blogs. In addition, further developments will be in the area of the design of marking rubrics and additional support for students through the feedback mechanism.





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## **DIGITAL LEARNING OBJECTS DESIGN FOR TEACHERS CONTINUING PROFESSIONAL DEVELOPMENT**

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### **Introduction**

This paper presents digital learning objects model for teachers and trainers continuing and professional development at schools and universities, that ensure not only availability of equipment, broadband internet / intranet connectivity and control, but also services that meet the educational needs of large-scale, quality and delivery and to have digital educational content based on new information and communication technologies that helps in a digital way to design learning objects, to collect, to store, transform and disseminate. It should be noted that technologies for information transmission such as communication, collaboration and information sharing very often provide a variety of ICT tools. This paper presents the issues educators face and addresses how to design interactive lessons or training sites that are adaptive, personalized, and motivational and express the desired content to be easily created, exported in various formats, and so on.

### **Theoretical framework for interactive learning objects design**

Many authors are analysing the interactive learning objects design which identify several critical challenges educators face when selecting learning objects: the learner's cognitive process, levels of interaction, evaluation, and instructional design; learning object repositories and learning object evaluation; and reusability of learning objects. Keegan (1999) and Moore (1989) consider interaction as the key to effective learning. Moore (1989) identifies three different interactions that exist in the education process: learner instructor, learner-learner, and learner-content interaction.

Perhaps the most well-known learning objects metadata repository is MERLOT (Multimedia Educational Resource for Learning and Online Teaching – [www.merlot.org](http://www.merlot.org)). The problem, however, with the existing repositories is not the availability of the resources, but the quality of the materials in them as Wiley (2000), Williams (2000), and Nesbit et al. (2002) point out.

## Technologies to design learning objects

Technical specifications are also important to consider when choosing the system for interactive learning objects development. They can play a crucial role in determining whether the content can be used and reused. Besides the common used standards and specifications also influence which learning management system may be used for distance learning (Rutkauskienė & Gudonienė, 2013).

In this part of the decision-making process, the IT, finance and marketing staff will all have different interests that may not necessarily be compatible. It is advisable for the central players to participate in considerations and discussions about a given system's features and limitations. The following is a brief overview of some of the most commonly used standards:

- CSF (Course Structure Format) was developed by AICC (Airline Industry CBT Committee). This course structure format focuses on tests, modules, etc.
- IMS (Instructional Management Systems Project) was developed by EDUCAUSE and builds on AICC's work. At the same time, IMS focuses on inventing labels that can be used to define the components of an online learning environment.
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- IEEE LTSC (The Institute of Electrical Electronics Engineers, Inc., and Learning Technologies Standards Committee) is responsible for the development of LOM (Learning Object Metadata), among other things.
- SCORM (The Shareable Content Object Reference Model) was developed by ADL (Advanced Distributed Learning). This is a consortium set up at the request of the American Ministry of Defence. It builds on AICC, IMS and IEEE.

ADL lists the following requirements for a standardised learning resource. It must be:

- Accessible – regardless of the user's location,
- Moveable – between different systems and tools,
- Lasting – so that it can adapt to new technological developments,
- Re-useable – in many and various contexts.

The main language used in the standards is XML (Extensible Mark-up Language) (Gudonienė et al., 2013). More specific points about the importance of ICT in the learning process (studies) are:

- Learning can be interactive & based on communication if ICT is used. This way a wider & more motivated learning environment in an education institution & beyond can be created. Learners solve problems communicating or working together.

- ICT usage allows learning to be applied according to individual needs, learning content (what do we learn?) & methods (where & how do we learn?).
- Learning can be done anywhere, using a computer, mobile phone etc. In this scenario it is important to make individual tasks for learners with special needs (blind, deaf or very talented ones).
- There is no need to teach all learners at once as ICT can control the process. This is very convenient for adult learners who have a job or look after their children.

In addition, there is a subset of educational institutions in the world that have not yet applied ICT in classes (or who are just beginning to). To tackle this problem, topic about ICT & institution integration should be discussed. Especially: teaching about information communication technologies, using information communication technologies in various lessons or lectures, applying newest technological solutions into the management of educational institution, creating a virtual learning environment.

Another important thing about ICT is that it has a lot of useful features related to continuous learning:

- Flexibility in respect of time & place (learning at home, using a virtual learning environment or distance learning).
- Flexibility in respect of learning material (courses are prepared for example according to organization needs).
- Easy access to information & other people.
- Convenient communication with other people using online resources.
- New approach to organizing learning (individualization of the process, better preparation & control of the learning material).

Despite many advantages (Gurbuz et al., 2013) of information communicational technologies in adult learning, it is necessary to encourage adults to use ICT and show how they can facilitate the learning process.

### ***Guiding Principles to Design learning objects for teachers in CPD***

The most frequently mentioned guiding principles are ‘the use of new technology in the classroom’, together with ‘quality of teaching’ (90%); directly followed by the ‘student’s needs’, ‘teacher’s needs’ and ‘college/organisation needs’ (87 – 82%). Personal growth is mentioned by 54% of the 22 respondents who answered this question.

National priorities, responding to change and reflective practise are mentioned by about 72% of the respondents as highlighted in Figure 1.

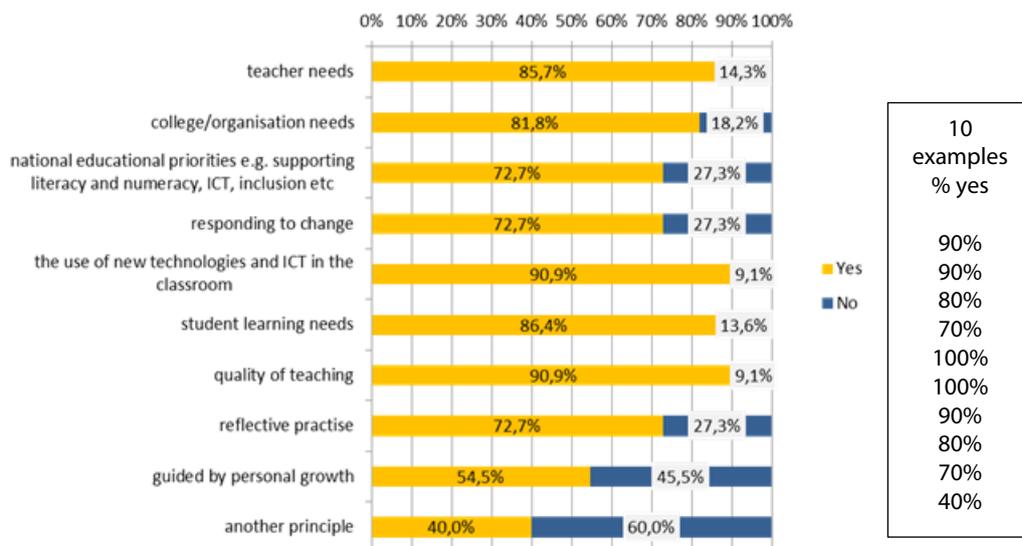


Figure 1. Guiding principles in design of CPD for teachers (N=22)

The learning goals of the CPD programmes are based on a national framework.

### CPD Curricula

What is interesting about the results of the question concerning the CPD curricula which are delivered in the institutions is the fact that some respondents report lists of more than 20 different courses and learning activities. The type and content of the reported courses are consistent with the guiding principles of the design. There are courses reported in the field of:

- Teaching;
- Learning;
- ICT (in the classroom);
- Professional expertise, mostly reported is the knowledge of technical changes and progress, for teachers in technical colleges;
- Personal growth and effectiveness.

Eight of the 18 respondents use Open Educational Resources (OER) or Massive Open Online Courses (MOOC's) in the CPD programme for teachers. Most of the time these are courses in a Virtual Learning Environment (VLE) like Moodle. One respondent reported that they prefer blended learning. In this way teachers from different departments and backgrounds can meet and exchange insights and knowledge on teaching.

13 respondents answered the question about the most successful course or learning activity in the CPD programme. The most successful courses are:

- Courses in the field of teaching (4);
- Courses on using ICT (3);
- Courses on content (robot programming, drywall installer's programme, customer care);
- Workshops by teachers themselves (2).

One respondent highlighted that identifying the most successful course depends on the perspective you take.

***Technology-enhanced learning is a key part of learning and teaching in today's society***

Every young person has access to technology whether it be via mobile phones, gaming computers or a straightforward PC and they will take it for granted in a way previous generations have never done. Schools / colleges / centres that take a positive approach to technology can engage their learners and enhance the learning opportunities available, as well as preparing their learners for the jobs they might be entering after school / college has finished.

What is technology enhanced learning? This could be through the use of technology that delivers text, audio, images, animation, and streaming video, and includes technology applications and processes such as audio or video tape, satellite TV, CD-ROM, and computer-based learning, as well as local intranet / extranet and web-based learning.

Technology is just one of the tools available to staff to increase the opportunities for their teaching practice but it is one with many options and a huge amount of flexibility.

Technology has many different uses in the classroom. Young people use technology for entertainment and social interaction through their phones and PCs, but may not consider it to be educational. The classroom can be an excellent place to introduce them to everything else that the technological world has to offer.

For the vast majority of schools / colleges / centres, technology will extend beyond the classroom too, into the operational running of the school / college / centre. Examples could include:

- Use community technology.
- To engage mixed groups of learners try using community technologies. By responding to questions and commenting in a forum or via a PC on their desk, you could get contributions from learners unlikely to put their hand up in class.
- Engage learners in wider school / college / centre issues.

In some instances the learners own technology could be used. Try using sports tracker apps on phones to identify and map the routes learners take to school / college, to gather data for a transport plan.

Technology is used extensively in design and technology and creating multiple iterations of an item in 3D on a screen can be more flexible and rewarding than in real life. Some online live comment feeds have attracted professional historians who bring history to life in real time. They recount events 'as they happened', for instance the search for the gunpowder plotters, or the Battle of Britain. When reported as if it were current news and a developing story, many new aspects come to life. Working in partnerships with schools / colleges / centres abroad can

be enhanced by running joined up subject themes via forums or jointly managed websites. Outcomes can also be pooled and publicly shared to other schools / colleges / centres.

### Tips for getting it right

- Unless you can provide it, don't make the use of technology compulsory. Some learners may not have the same access as others outside the school/college/centre environment.
- Use your learners as champions: many will have more expertise than the staff.
- Invite debate online and be available to answer queries.
- Test out a few options before committing to buy: you may find some technologies suit your needs much better than others.
- Don't rely on technology for everything. Set some projects that specifically exclude the use of technology.
- Make sure you have access to technical support: technology can be complicated to master and underused as a result.
- Use video and podcasts to enable past learners to contribute to future classes.
- Use video to record your own classes to help you consider your own teaching techniques.
- Set up a competitive pot of cash for technology innovation, and encourage departments to work with their learners to bid for it.
- Make sure technology is a regular stream of CPD, to keep staff up to date.
- Be clear in your aims and make sure the technology available complements them. Don't use it if it doesn't add anything.

Figure 2. Using technologies

## Conclusions

Developing high quality learning objects is a daunting task involving collaboration among subject specialists, programmers, multimedia designers, and evaluators/researchers.

Two key technical features were addressed in the development of the learning objects – reusability and accessibility. The guidance and perspective of experienced subject matter teachers was used to create meaningful objects that could exist in a larger context.

The learning objects designed at the HE level by pre-service and experienced teachers maintained that learning objects need to be sufficiently challenging, so experienced teachers were asked to brainstorm about and select areas where their students had the most difficulty.

Learning objects designed and developed using a multi-component model are viable learning tools for students as well as learning objects which were beneficial, particularly when they had a motivating theme, with visual supports, and interactivity.

Developer programmer and designer coupled with extensive pilot testing on a wide range of subjects are recommended to ensure clarity of instructions and help, as well as ease of use.

Considerable time should be devoted to understanding what motivates the learner, as well as the key elements of the learning object that enhance learning.

The theoretically-based online evaluation is needed to identify critical components and to have close contact with students that could affect the success of learning objects.

The main problem reported with current learning technologies is that they are held back by proprietary standards. Thus content authoring systems create content that will not run appropriately under many learning management systems.

Both technical and learning-based definitions offer important qualities that can contribute to the success of learning objects. With respect to a technologically guided definition, key features include accessibility, ease of use, and reusability. Making learning objects readily accessible over the web helps address the difficulties teachers experience in acquiring the latest versions of educational software.

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on Transfer of Innovation. The aim of the project is to support personalised and professional training pathways for VET teachers through development of innovative and ICT based CPD tools and materials, mainly in the format of e-Portfolios. (Project No. 2012-1-IE1-LEO05-04722).



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## **CRITICAL REFLECTIONS ON COURSE DESIGN IN OPEN UNIVERSITY**

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### **Self-evaluation of the learning environment**

During its 30 years Open University in University of Turku has widened the use of ICT in teaching. In 1980's tutored study groups were the backbone of learning environment and it was supported with different learning materials, trained tutors and audio-meetings between study groups. Now Moodle-platform has a crucial role in most of the Open University courses as classroom aids or as part of blended learning. Recorded lectures, web-meetings, digital materials of the library, OER, interaction and assignments play a crucial role in current learning environment. Annually there are around 7,500 adults studying in Open University courses and 12 course designers implement the studies in collaboration with faculties and cooperative networks. Course designers are experienced but face new challenges when pedagogical ideas and ICT changes. During the self-evaluation process the Open University aims to modernize the learning environment. This paper describes steps done so far, current findings and future plans.

### ***Process of self-evaluation***

During the years new technologies have emerged and course designers have embedded them to existing courses. At the moment learning environments of different Open University courses vary and there is collaboration mainly within certain subject areas. Usually course designers work rather individually during course design. Open University has common guidelines in administration of studies but in pedagogical design there is more freedom. There is interest to evaluate current models of learning environments and provide recommendations common to all Open University learning environments. Evaluation criteria were decided together. Course designers agreed four topics as most critical factors in the quality of Open University studies. These are:

- guidance/tutoring,
- interaction and communication,
- ICT used in teaching and learning,
- course design process.

As fifth criteria was a special topic or problem which course designer identified self. Evaluated courses were face-to-face courses, blended learning courses and totally online learning courses. Each course designer chose two courses for evaluation. The first one described best practices which others can copy and the second one needed development. Beside this course designers described the reasons of their choice, shared Moodle course key, the curriculum and number of students 2013-2014, explained amount of completions per course and in the whole degree. After this 2-3 course designers got familiar to the case and interviewed the course designer and secretary for more details.

Table 1: Self-evaluation process of Open University studies in Turku University in spring 2014

Pilot subjects	Evaluation criteria	Topics for further development
History	<i>COURSE DESIGN</i> <i>TUTORING</i> <i>INTERACTION</i> <i>ICT</i> <i>OWN</i> <i>TOPIC/QUESTIONS</i>	Course design & tutoring
Law		Assignments & timing
Environmental studies		Student feedback & completion rate
Psychology		Moodle-model, user interface and tools, lecture recordings
Nursing science		Methods to teach research methods & information literacy skills

In autumn 2014 small groups of course designers will evaluate other courses. Aim is that each course designer gets feedback and recommendations. Also teachers from the faculty and students are invited to the next discussion. Aim is to continue peer support also after the year 2014.

## Findings of self-evaluation process in spring 2014

### **Peer support wanted and needed**

Peer support is seen as an important method to increase quality of course design and learning environments. After first evaluation round it was obvious that course designers would like to have more systematic collaboration when they build new courses or modify the existing ones. Working as a peer already during a 4 month period supports professional development of university teachers. The informal method supports university teachers in authentic working conditions. Peer support complements other methods of professional development according to own aims and objectives. Peer support is better than traditional education in hectic working life conditions when results are needed quickly. It is an open question can informal peer support be structured without losing the benefits of informal peer communication. In research article pilot peers of teachers were working 4 months together. First they set personal and peer level objectives for their learning. Peer support meant observations of each others' teaching, feedback and monthly discussions. Beside these peers could use methods they chose self like job-shadowing (Lappalainen et al., 2014).

### ***Lack of adequate resources***

In dual-mode universities the infrastructure of online learning is connected to the common strategy of ICT resources meant for teaching and learning. The need for technological tools in teaching of full time students is not as crucial as in the Open University. But the needs are getting closer. University wants its students to complete minimum 55 ECTSs in a year and flexible learning environment is one way to promote it. According to research the major explanations of successful full time university studies are learning to learn skills, skills of independent learning and preparation skills of examinations and easy combination of personal life and studies (Saari, 2013). In University of Turku it has been Open University which has piloted and promoted many online tools for learning: learning platform, editing software, web-meetings, lecture-recording systems and many more. When full-time students get flexibility to their studies it supports at least students who work at the same time as studying. University should have a strategy of ICT resources meant for teaching and learning. At the moment this means more effective use of Moodle and publishing tools for online materials.

### ***Moodle-model for online courses***

Moodle-platform is used in almost all courses of Open University. In Moodle-platform there are about 20 different types of activities available and each can be customised (Moodle, 2014). In learner-centred course design aim is to activate learners with individual and group-based activities. Based on the curriculum different activities are chosen and modified according to aims and objectives.

There are still plenty of different possibilities to organise the online environment. Course designers are not usability experts nor have skills of graphical design. From these reasons there rises a need to have a common Moodle-model as a starting point for all Open University courses. Course designers can concentrate on pedagogical examples and practices of Moodle-platform and promote the quality of learning processes together. Pedagogical examples and practices should be available for beginners and part-time teachers.

Course designers would like to have common Moodle-models which help to design the Moodle platform. Graphical layout and basic elements of the Moodle can be recommended to all but rest is based on the pedagogical solutions of the course. There are also more developed ways to use Moodle but in this case university should invest more to the development of virtual learning environments.

### ***Lecture-recording infrastructure***

Even though lecture recording is not any kind of a pedagogical innovation it is very much used in Open University courses. In spring 2014 we evaluated how many lecture recordings our course designers do, which technology they use and what is the student feedback. The amount of hours spent for lecture recordings in a year were close to one person-year which was all away from pedagogical design and communication with the students. This is why

Open University recommended University of Turku to invest to a proper lecture recording system with possibilities of automatic recording. The disadvantage of recorded lectures is that they are far too long. But for those students who cannot attend the lectures it is the only way to continue studies. The good point is that teachers personal impact can be seen in the video and enthusiastic teachers motivate students. With low resources pointed to media production it is still possible for teachers to engage students with personal videos. There doesn't have to be high-fidelity studio recordings available (Levy, 2014).

Table 2: Amount and type of lecture-recordings in Open University 2014 (Hakanurmi & Pohjanen, 2014)

Recording tool or format	Amount of recordings
Adobe Connect	189
Presenter	181
MP3	135
Other (Second Life, Captivate, Echo 360)	23

### ***Student feedback is too one-sided***

New methods to gather student feedback is also part of further development. There is an evaluation form common for all Open University courses but it doesn't work well at least when student numbers are very small. Evaluation form will be formulated all the time but beside this other kinds of evaluation methods are welcome. One option is student interviews or discussions with students. To involve students into self-evaluation process of Open University studies is one output of the self-evaluation process.

### ***Subject specific challenges***

Typical questions in course design and tutoring were like how to best support students in academic skills like in preparation of difficult examination. There was a video tutorial available in law but still completion percentage was poor. In timing some courses used assignment/week rhythm but for others it seemed to be too much.

Lecture as a teaching method is problematic because they motivate and interest students but don't activate student's own thinking (history). To plan equal workload to assignments of different e-Learning models is difficult. In evaluation of essays there were different practices how to mark the completed courses. It is good to have different options in assignments but too flexible studies are not any more easy to understand (psychology). Non-stop registration to the courses means extra work for course designers and secretaries so instead three registration periods per year was preferred (environmental studies). Students were not interested in learning of research methods and information literacy skills and new ideas for this were needed (nursing science). There were differences in concepts even within one course and use of concepts in Moodle must be more uniform (environmental studies). In all subjects course designers felt they need support in use of Moodle tools in order to design user-friendly online environments and pedagogically meaningful learning processes and assignments.

## **Conclusions**

There are different needs in the development of Open University learning environment. Part of them are pedagogical and organisational and part are technical. As Bates and Sangrà (2011) have stated the greater the role of technology, the more important it is to move to a project management model, involving instructional and media designers as well as subject experts. Open University education is arranged in cooperation with university departments meaning collaboration with professors and lecturers. Its objectives and requirements correspond to those of regular degree studies. Open University cannot award degrees, but credits are transferable and can be incorporated into a university degree. Expertise of e-Learning comes mainly from Open University.

Open University will add peer support in course design and in evaluation of learning environments. There is lot of everyday communication between course designers but it is not easy to ask wider attention to own course design and evaluation without officially defined roles or periods. We are looking for models how to add peer support in a more systematic way inside Open University.

After working many years together in same groups new ways of thinking is welcome. Already a trainee supports professional development of teachers because it helps to think differently. It means effective cooperation only inside the Open University is not enough when aim is to build modern learning environments. And because technology is never stable education based on information and communication technology must conform and be renewed in time with pedagogical reflections taking place all the time. Benchmarking against other institutions is seen an important part of self-evaluation process in the near future.

Best way to support the quality of Open University's learning environment seem to include similar kind of elements in the working environment like does an effective and interesting learning environment; there is tutoring & guidance, interaction & discussions, problem-based working with authentic questions and supporting materials online for individual working. Open University has to move towards peer supported working and international benchmarking. At this stage of the process ideas from other organizations with similar kind of development process are welcome. Beside this kind of benchmarking collaboration with other organizations Open University is interested to join research projects dealing with adult education in modern learning environments.

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## THE SOUTH BALTIC WEBLAB: CAPTIVATING PUPILS IN MARINE SCIENCE

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### The problem

It is no secret that most part of pupils after graduating the school choose social sciences or humanity subjects to associate their future with. In general according statistical data through the European countries about 30% would rather choose natural, technical or applied sciences. The problem is that almost fifteen years the number is dropping down. The similar tendency is captured in Marine sciences at least in The South Baltic countries.



Figure 1. The number of students in natural, technical and applied sciences in Lithuania by year, y-axis depicts percentage (Data from Lithuanian Statistical Department)

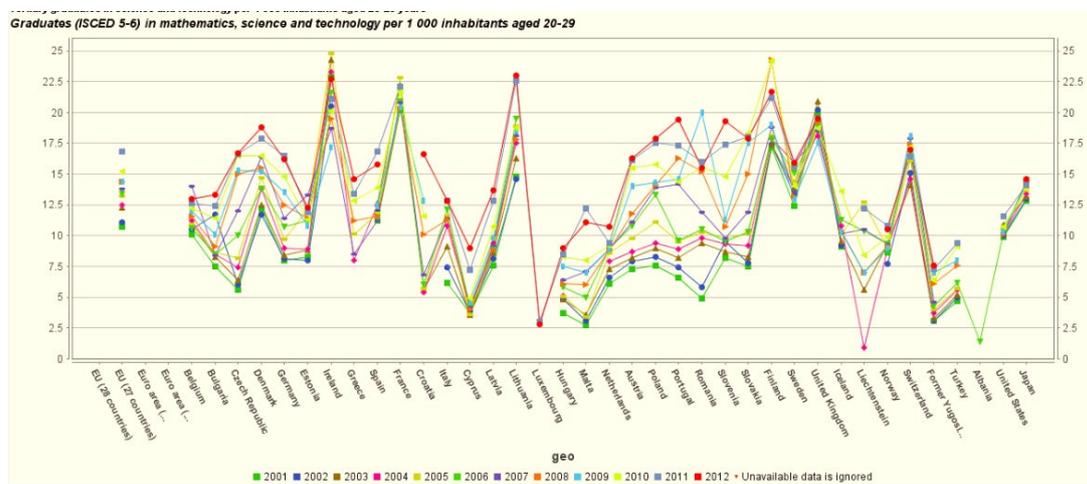


Figure 2. Graduates in mathematics, science and technology per 1000 inhabitants aged 20-29 by country (Eurostat)

## **The goal**

A group of five marine research institutions from five Baltic Sea countries worked together with computer scientists in a project to promote the field of oceanography among pupils. The project South Baltic WebLab, funded by the South Baltic Cross Border Cooperation has followed different approaches to raise interest among school students, to train their skills, and to support their access to marine sciences.

## **The way**

Within the project pupils get the chance to receive a first-hand insight into this profession by reading blogs from “real world” scientists. Students who already got interested can use a database on the project website to see which institution or enterprise in his or her vicinity employs marine scientists. The database also offers vacancies for student internships. Probably a highlight for the most skilled and interested pupils is to join one of the yearly science camps. These camps give students the unique chance to test what it means to actually work as a marine scientist. For about ten days the school students work together on their own research topic in international teams communicating solely in English, using “real” scientific equipment and being supervised by scientist. By presenting both concept and first results of the South Baltic WebLab the project team intended to encourage other colleagues to open their mind for this challenging field, the interface of science and society.

## **The place**

The main components of the project are web-based e-learning modules on a range of different topics, which pupils can explore in a problem-based, self-directed and playful way. five web-based learning modules, which invite the users to act as marine scientists by meeting current research questions and developing by themselves strategies to solve them. Biological as well as chemical, geological and physical aspects of modern oceanography are dealt with. The modules include topics on the History of the Baltic Sea – long-term geological processes – to decipher the sediments’ message and discover the past, Coastal Dynamics – to understand it and deduce respective protection measures, Ecology of the lagoons – to study the ecology of South Baltic lagoons and bights, Water exchange processes – to track the traces of North Sea water in the Baltic Sea and analyze the impact, Biogeochemical and physical processes in the open Baltic Sea – to learn how the cycles of essential elements are functioning in the sea.



Figure 3. The South Baltic WebLab project on the web.  
The gate that opens wonder of marine science for youngsters  
(<http://southbalticweblab.eu>)

### The motivation

The students can learn more effectively, if they are actively involved in the learning process (Bonwell & Eison, 1991; Sivan et al., 2000). Various ways are available to implement active learning strategies in schools. One of interactive learning strategy, shifting the emphasis from teacher centred to more student-centred activities, is a case study method involving ICT. Case studies have also been linked with increasing student motivation and interest in a subject (Mustoe & Croft, 1999; Strakšienė & Baziukaitė, 2010). One can gain greater understanding and improve skills in judgment when one works through a problem, but not just passively listens to a lecture. Similarly, there will be greater learning results if someone “uses” a theory in practice.

It has been shown (Passey et al., 2003) that ICT has a positive impact on pupils’ motivation and it engages pupils more into the learning as they get elder. Usage of ICT helps for students to keep focus on learning goals indicating their concentration to the learning. The use of ICT in education primarily was based on a very technological point of view, but now has evolved to a systematic view emphasizing the interrelated changes in pedagogy and organizational culture (Zang, 2001). As the practice of leading countries (such as United Kingdom, United States and China) shows, ICT help to create constructive, supportive and rich learning

environment in schools starting from primary ones and ending with universities. Regarding to Passey et al. (2003) with practical training activity the following learning processes:

1. engagement,
2. research,
3. writing and
4. presentation are considered.

The one should say that WebLab follows this sequence and even more creates real life situations to test the science and supports with the activities in the virtual lab.



Figure 4. The South Baltic WebLab: five eLearning modules

## The actors

The activities supported by the South Baltic Cross Border Cooperation Programme. Five marine research institutes were involved: Leibniz Institute for Baltic Sea Research, Warnemünde, Germany; Institute of Oceanology PAN, Sopot, Poland; Klaipeda University, Coastal Research and Planning Institute, Klaipėda, Lithuania; Technical University of Denmark Riso, National Laboratory for Sustainable Energy, Denmark; Lund University Dept. of Earth and Ecosystem Sciences, Sweden; Szczecin University, Faculty of Geosciences, Poland. The job has been done with tide participation of computer scientists from the University of Rostock, Institute of Computer Science and Klaipeda University, Virtual Learning and Information Systems Centre.

## The WebLab concept

WebLab involves variety of actions. For the virtual part of the project flash based activities are being designed and implemented. The project is developing two versions of laboratory. One is available directly through the project website as a pop-up link (Figure 4), which opens a module with all its activities as one file. The file than can be viewed step by step or jumping directly to the appropriate scene.

## The South Baltic WebLab: Captivating Pupils in Marine Science

Dalia Baziukė

The learner can benefit through the virtual learning environment (Figure 5) if they create an account. The social ability to communicate with peers and scientists online, just on demand according the topic, store session information, results and grades of the activity, track their-own progress within the course and many more are provided.



Figure 5. The module content on the screen

Generally each module has four stages. The first one provides an introductory story to motivate student to get deeper into the content (Figure 6: Start your activity here). Students can follow the content on full screen mode passing to the experimental part, where with the use of virtual tools they are asked to solve practical issue. The second one gives additional materials. This could be glossary or additional content to be studied. The third one requires to answer quiz or solve some puzzle (Figure 6: Summarize what you have learned) and the fourth one asked the students for feedback.



Figure 6. The general structure of the module inside the virtual learning

## The result

All modules have been tested with the groups of pupils. At the end of the learning activity pupils were asked to give us feedback. The most interesting from all the questions in the feedback survey is the question about willingness to become a real scientist in their life. The result is depicted in Figure 7. Our team was happy to get know that at least half of participants answered “Yes”.

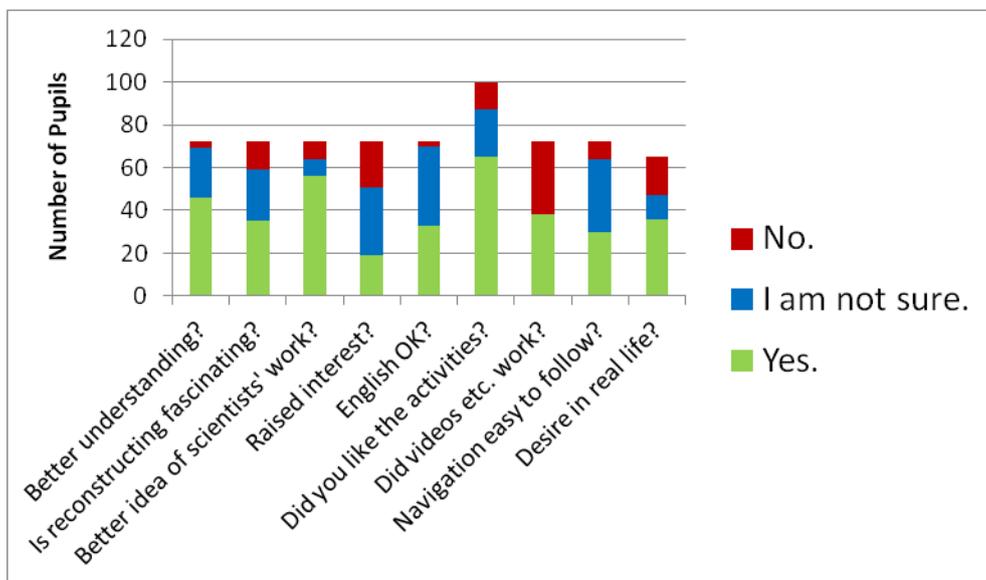


Figure 7. Result from feedback surveys

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## **E-LEARNING PARADIGMS IN APULIAN LIVING LABS**

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### **Introduction**

The issues of the most advanced paradigms in e-learning, such as social learning (Bandura, 1977), adaptive learning (Marengo et al., 2012), e-learning 3.0, augmented reality and virtual reality, and robotics applications to e-learning have been tackled in Apulian ICT Living Labs projects. The Living Labs approach represents a new way to address the research activities where innovations, such as new services, products or application enhancements, are validated in empirical environments within specific regional contexts. Apulia Region decided to foster this approach in Apulian ICT Living Labs and the follow up programme Living Labs SMART PUGLIA 2020 to facilitate the growth and the development of Apulia SMEs specialized in the Information and Communications Technology (ICT) field, digital services and contents. This paper introduces the e-learning projects in the Education & Training domain of the Apulian ICT Living Labs and reports the e-learning technologies developed to address the end user needs in the domain above (Avellis et al., 2014). It also underlines the clusters of the e-learning projects in Apulia Future Learning 3.0 Living Lab.

### **Overview of e-learning issues in Apulian Living Labs**

The approach of Living Labs, a concept developed at the Media Lab and School of architecture and city planning of MIT, Boston, Eriksson et al. (2005) represent a user-centric research paradigm for prototyping and validating complex solutions in multiple evolving real life contexts. This applies not only in industrial settings, but also in the development of new products and services that meet market expectations and ultimately led to the creation of more and better jobs. Living Labs have thus shown the ability to mould the opportunities offered by new ICT to the specific needs and aspirations of local contexts, cultures, and innovation potentials (EC, 2013; Markopoulos & Rauterberget, 2010). This approach is shaping the agenda of Regional Policy and Territorial Cooperation for 2014-2020, but also HORIZON2020 and the “Smart Specialisation” conditionality requirement, engaging all EU regions and to realize a smart, sustainable and inclusive growth, that is Europe 2020 (EC, 2010a), and Innovation Union (EC, 2010b), which sets out an integrated and strategic approach exploiting and leveraging Europe strengths in new and productive ways. In Europe the potential and opportunities generated by a Public-Private-People Partnership from ENoLL (2010) shifted the scope of Living Labs from pure academic experiences to regional or

national innovation systems (Hsuan-Yi, 2012). The Apulia Region intends to foster the growth and the development of Apulian SMEs specialized in the Information and Communications Technology (ICT) field, digital services and contents, by using the Living Labs approach, implementing them as a regional policy to improve ICT industry and services in the region. Avellis et al. (2014) give an overview of the e-learning projects in the Education & Training domain of Apulia ICT Living Labs.

In this section, we outline the main outcomes underlining the most innovative aspects of the Living Labs projects. SPLASH (Smart Platform for Learning and Active Social Habitat) project (2013) facilitates education and training paths in the school, and enhances their effectiveness by developing a combination of disciplinary and trans-disciplinary approaches, class, individual and network with full integration and development of ICT technologies. Through research, participatory design and experimental development, the realization of an enabling platform for the Social Learning has been achieved, for the use of schools (teachers, students, families, experts). The main issue tackled by this project is the social learning paradigm addressed via a web platform flexible, integrated, social, open source, for the implementation of the process of teaching and training of the students, teachers and schools, and for its integration with the classroom activities: ICT tools can help to support the construction and management of a hyper-dimensional space of knowledge, access “intelligent” content authorship and authenticated by the experts, the creation of individual paths in the acquisition of knowledge and skills, enhancing aptitudes and potential of individuals, participation and sharing of the users, with the aim of a continuous development of the instrument, as well as the definition of a social model for the aggregation and authentication of multimedia content, which includes open content can be acquired from the Web. The same issue of S.P.L.A.S.H. is addressed by the EDIL\_LEARNING (EDIL-Learning for Training in the Building Sector) project (2012) that is an open source social learning platform able to support training in the building industrial sector. The solution consists of modular and integrated functionalities in order to support formal and informal, individual and social learning processes. Different issues are tackled instead by the ROBIN (ROBot Interaction system for visuo-spatial data presentation for effective learning) project (2012) to address the dyslexic children educational needs. It includes a platform of Learning Management System interfaced with tablets, PC, Smartphone and robotic multimedia systems for personalized learning and the production of educational ad hoc contents, for students with specific disabilities, such as dyslexic which involves the 4-5% of the school population, on average one every class of 20 students. The kit produced in this cluster will include an anthropomorphic robot which interface itself with several hardware systems such as tablets, PC and Notebooks and a LMS platform hosted in a remote server connected via Internet. The hardware systems will have a constant dialogue with the server which will contain all the educational contents and will register all the progresses made by the students during the execution. The server, furthermore, will allow the communication and sharing of information among the several actors involved: the teachers and pedagogists can have data on the effectiveness and use of the different didactic modules, the parents on the competence level and progresses made by their children, the public administrations on the activities developed by the schools and the

obtained results. The same anthropomorphic robot and hardware systems tablet PC and Notebooks, as technological aids for children in the school and pre-school age, affected by the troubles of the autistic spectrum are tackled. Instrument for the educational and rehabilitative activities will play as a mean of socialization, reducing the stress introduced by the emotional inferences. The system will operate as domestic tool allowing the educator to operate in teleworking, assisted by a parent. A very innovative didactic modules production based on Augmented Reality (AR) and Virtual Reality (VR) is the aim of the INRL (Interactive Network Remote Learning) (2013). It investigates the web 3.0 and new media tools, such as augmented reality and informal learning which become a dominant aspect in the evolution of e-learning from the past virtual learning environments, based on the use of LMS/LCMS, with more communicative and flexible personal learning environments. These are user-centred environments supporting informal learning, derived from the resources that can be founded and produced on the web, and formal learning based on well defined schemes of e-learning platforms. It also manages the development, testing and integration of specific training modules within e-learning platforms already in the market, or “interactive/experiential pills” which allow users to know, using interactive technologies-cognitive and smart (3D augmented reality and interaction) the concept of learning by interacting and remote collaborative learning. An interactive area is dedicated to students and teachers and is the real innovation of the project. It is an immersive virtual space where there are proposed new interactive learning modules, in order to stimulate in the user a high understanding of the content. This area, in line with most modern learning theories, promotes the development of training activities through the integration of learning-interaction-experimentation-game modes. The advantage of the recreational-experiential approach, measured in terms of involvement and the motivation of the learner reduce the amount of time for learning. The same technology, namely the AR and VR are at the basis of the EP\_LAB (Easy Perception LAB) project (2013), which do not intend to substitute the sensorial experience on the field, but can amplify the possibilities of experimentation and the accessibility to different types of users. In the didactic field the virtual applications allow the teacher and the students to jointly participate to the creation of the knowledge. The student should directly experiment to know a cognitive field, that this theory is parts of the recent applications of Embodied Cognition. The virtual reality and the augmented reality try to reproduce the primary conditions of the cognitive behaviour, the perceptive behaviour. From here the need to experiment new tools for interaction, which allows the integration of new learning objects in the didactic models from one side, and the experimentation of new technological prototypes with the aim to augment a laboratory context inside a didactic context.

### **The Apulia Future Learning 3.0 Thematic Table**

Apulia Future Learning 3.0 (AFL 3.0) is a cluster and a Thematic table of Education & Training projects in Apulia Living Labs, based on a regional aggregation of SMEs, public organisations, schools and universities located in Apulia region, linked by the desire for necessary change in learning methodologies for the European society of the future. With reference to the activities of the local Living Labs funded through the Apulian ICT Living Labs

programme, Apulia Future Learning 3.0 represents a true unique experience of thematic aggregation of stakeholders in which technologies are the tools of connection between single projects and the LL protocol is the mechanism that allows the growth of the network, looking at three lines of development:

- Innovative learning, with particular focus on social learning;
- New Media and Robotics, with particular focus on friendly interfaces;
- Adaptive Learning, with particular focus on inclusion processes.

Based on the expertise of each partner and in particular on the experience of each Local Living Lab Project, the Apulia Future Learning 3.0 supports the three lines of activity previously mentioned, emphasizing the *features* and the *performances* of each related project as the following scheme:

### ***Innovative Learning***

This line of technological specialization includes the SPLASH consortium (2013) EDIL\_LEARNING Consortium (2012) and SCUOLA APERTA Consortium (2013) local Living Labs projects. It addresses Social Learning Platforms (SPLASH, 2013; EDIL\_LEARNING, 2012) dedicated to schools and professional building sector vocational schools: teachers, students, families are the users able to use the flexible and open source platform through all communication devices (tablets, smartphone, notebooks). The platforms provided have also: e-library of self designed contents; e-portfolio of student skills, with the deployment of services aimed at expertise certification and the collection of credits; Services for students with Learning Disabilities; Services for MultiLanguage learning; Market place Services for content socialization. In particular, (EDIL\_LEARNING, 2012) the technological solution offers integrated learning modules aimed at the new training needs of the sector, evolving with new materials, new building techniques and the environment sustainability. The platform has been realized by a co-design strategy between professional schools of the building entrepreneurs association, the University of Salento and the companies offering state of the art technologies. Finally, SCUOLA APERTA (2013) encompasses a Digital Administration Platform for Schools. Open Source based, which offers services for a more efficient management of the administrative processes and the complete education infrastructure.

### ***New Media and Robotics***

This line of technological specialization includes the ASTRO (2013), EP\_LAB (2013), ROBIN (2012), CLIOedu2.0 (2013), INRL (2013), ICT and E-LEARNING (2013) local Living Lab projects. This line of development aims to provide a humanoid robot for autism spectrum disorders (ASD) (ASTRO, 2013). Advanced Tool for education and rehabilitation, it is useful in terms of socialization of children, reducing stress due to emotional inference. Fundamental role of end users in the co-design of the learning module through computer interaction between children and robot. It (EP\_LAB, 2013) also includes a platform of learning management system, based on use of Tablet, PC, Smartphone e robotic multimedia systems

for individual learning and for the contents production aimed at students with Learning Disabilities, in particular students with dyslexia. Fundamental role of users in co-designing the learning module through computer interaction between children and robotic systems. By using augmented reality techniques, a new approach has been tested using cultural heritage for learning (EP\_LAB, 2013). It is possible to transform historical heritage into an interactive object in order to increase the access to museums for learning. This technique allows the use of museums also in terms of remote access. ICT and E-LEARNING (2013) and CLIOedu2.0 (2013) based on a virtual environment, the system offers solutions for new management models of knowledge processes at schools, by using a mix of NGA and cloud computing for a collaborative space of knowledge building. Based on an approach of learning by interacting and collaborative remote learning, a new methodology (INRL, 2013) of on-line learning has been tested, capable of promoting a more suitable interaction between end users and contents. In particular, 3D augmented reality has been applied to professional on-line training modules in order to create the conditions for a more attractive learning environment, also in terms of business success.

### **Adaptive Learning**

This line of technological specialization includes the Agripointer (2012), ALL (2013) local Living Lab projects. Agripointer (2012) provides a technological supply for agrifood workers' training aimed at the implementation of ICT tools for certification processes in the value chain of agrifood productions. The system allows the adaptation of training procedures to the firm's dimension and to the SMEs business model, in order to promote the local products. ALL (2013) is an adaptive system of web-based learning, aimed at offering learning tools to cross cultural gaps and gender gaps. An "adaptive" system uses the Learning Objects in the most appropriate way, in relation to the student's competence and the course's objective in such a way to build an ad hoc training course for each student. The project ALL will develop a prototype which can simulate a predictive didactic instrument able to define the characteristics of a user (on the basis of an on-line questionnaire) understanding which are the most "adaptive" Learning Objects to his training in relation to the objectives defined by the teacher and avoiding the "risk" situation in which the student, feeling less motivated during the training course, abandon it.

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## **EMPORT – IMPROVE EMPLOYABILITY AND ENHANCE EUROPEAN COMPETITIVENESS THROUGH THE ACQUISITION OF LANGUAGE AND CULTURAL COMPETENCES IN PORTUGUESE**

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### **Description**

EMPORT is an open and distance learning course that aims to improve the employability of European citizens and company competitiveness through the acquisition or improvement of language skills and cultural competences in Portuguese.

The Portuguese language course is based on real company needs and uses ICT based resources: animations, pictures, sound files, etc., which makes learning not only more dynamic and fun, but also more effective and long-lasting. The language is acquired through practical cases that represent real-life situations from the business world. The course will allow both employees and employers who travel to a Portuguese speaking country to maintain simple conversations or even negotiate with their counterpart. They will also acquire essential vocabulary on such areas as marketing, banking, business, customer support or entrepreneurship.

Moreover, and not surprisingly, EMPORT also teaches everyday functions, thus allowing the user to introduce him or herself, give directions, get a taxi or book a hotel room. Therefore, it can be a useful tool for business people, students, even those who are not directly related to the business world, or tourists by allowing them to involve themselves more easily with the local people. Furthermore, it allows European citizens to access the culture of Portuguese speaking countries, with a particular focus on Brazil.

The course includes the A1 and A2 levels of the Council of Europe’s Common European Framework of Reference for Languages, and we have defined “can do” descriptors in four key skills: listening, speaking, reading and writing.

## **Summary of its novel characteristics**

### ***EMPORT objectives and products***

In order to achieve the general aim, particular objectives were established:

- To research available multimedia courses and other language opportunities for learning Portuguese, highlighting the available resources for Brazilian Portuguese.
- To research the needs regarding language and cultural competences of staff from companies dealing with Brazil or other Portuguese speaking countries.
- To produce a Web Site about Portuguese language and the culture of Portuguese speaking countries.
- To produce a multimedia and interactive business language course in Portuguese.

### ***Target groups***

The target groups are mainly European citizens interested in enhancing their linguistic and cultural skills and competences by learning Portuguese, together with organizations that provide courses in Portuguese language and culture. The course is adapted to the particular needs and interests of companies dealing with Portuguese speaking countries and students attending courses in business related areas.

These are professionals who are aware of the increasing importance of Portuguese for international business due to the current economic growth of such countries as Brazil, Angola and Mozambique.

### ***Webpage***

A website ([www.learningportuguese.eu](http://www.learningportuguese.eu)) was launched at the beginning of the project containing information regarding the project, its aims, the expected results and the partners involved. This website also includes the cultural component of the project, and has relevant business information for company staff dealing with all of the following Portuguese speaking countries: Portugal, Brazil, Angola, Mozambique, Cape Verde, Guinea-Bissau, São Tomé e Príncipe and East Timor.

Coming soon, you can also find some useful resources when studying Portuguese that complement and extend the course content. This list may contain links to dictionaries, thesaurus, official sites, educational materials or media from Portuguese-speaking countries. It will also include a separate section with the latest economy news in these countries.

### ***Social media***

We are aware of the growing importance of social networks and of partaking in them. Therefore, we will have our own profile in such popular networks as: Twitter, Facebook, LinkedIn and Youtube. This serves the purpose of making EMPORT widely known, thus allowing us to reach a larger number of potential users. However, this will be complemented

## **EMPORT – Improve Employability and Enhance European Competitiveness through the Acquisition of Language and Cultural Competences in Portuguese**

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by other dissemination actions. Moreover, social networks are a powerful tool to create strong networks of users and to maintain close contact with them.

### **Content**

EMPORT's pedagogic perspective is aimed at helping students learn gradually and with little effort, since it is based on the idea of adding new material slowly and always contextualized in the best way possible.

Materials are focused on a business approach, according to the aims of the project. The course is composed of 11 units, where 10 are based on a particular business topic such as fairs, money and banking, negotiation, market research, personal branding, economy, business travel, negotiation, partnership and entrepreneurship and the remaining unit serves as an introduction.

Each of the units introduces the topic through an animated dialogue in which learners are exposed to relevant vocabulary and grammar structures. These will be put into practice through several exercises that will strengthen and extend knowledge on the subject. These units also include the cultural content related to the topic and the country represented in each one.

There is also a section that is common to all units in which vocabulary and grammar are presented clearly and schematically so that students can consult at any time.



Figure 1. EMPORT Language Course

### **Features to be demonstrated**

The EMPORT demonstration will be organized into two parts.

First of all, the aim and aspirations of the tool will be explained as well as a brief explanation of the previous research and creation process, so that all those present understand the reasoning behind the creation of the course.

Secondly, there will be a demonstration of the course where the audience attending will see how to take full advantage of the tool. We will explain how the course works, its different units (topics) and learning sections, and some of the characters (coming from all different Portuguese-speaking countries) will also be introduced.

### **Significance of the contribution and its relevance to the conference themes**

Based on the content, target groups and tools implied, we can conclude that EMPORT is focused on improving scaling up work based learning by ICTs in adult and lifelong learning, always from an Open and Distance Learning point of view.

The main target group of the EMPORT Course are working people who want to improve their labour skills by the acquisition or improvement of language and cultural competences in Portuguese. The increasing importance of some Portuguese-speaking countries show the relevance of the knowledge acquired. EMPORT suits them as it is a free on-line tool that can be used anywhere and at any time.

EMPORT contributes to the inclusion of learning methods through electronic platforms and helps people move up the career ladder by improving their competence in Portuguese.



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## **INTERNET SERVICES IN THE WORK OF UNIVERSITY TEACHER**

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An important part of the educational process is the teacher who has the theoretical and practical skills in the discipline, and also able to use external resources to find right and relevant information for further development. Modern development of the Internet allows each user to find their niches for development, it does not always explain what and how to use. Therefore, it is important to teacher's role not simply to use modern Internet services in their work, but also to teach his students using these services.

Using of web 2.0 technologies in learning process is quiet popular topic that is discussed all over the world. Below several examples of web 2.0 utilizing in learning process in different countries are presented:

In Canada (Quebek) In the Les Compagnons-de-Cartier highschool Pedagogical blogs to all school subjects have been introduced and the research among students regarding it using has been carried out. The conclusions of the research are: blogs as educational tools are valued highly by students because of their specific qualities. Blogs create an authentic context for writing and sharing, blogs are easily incorporated in “natural” global dynamics. In reference to The University of Genoa, Italy and Veliko Tarovo, Bulgaria blogs for foreign languages – French (FLE) have been introduced. The course activities are based on a blog narrative – they are aimed at students’ self-reflection skills stimulating. The analysis of their products published in the blog and the questionnaires they have filled in prove that blogs are especially useful when a narrative technique is applied. Students’ self-reflection is stimulated by the sharing of learning and life experience and it leads to a greater awareness of new perspectives of using IT. Students declare they have understood the role of this instrument (the blog) and have estimated its role as a means to an educational end. It is based on learning French and mastering Web 2.0 for educational needs. Else in Bulgaria blogs have been used in primary education. Primary teachers shared presentations, video materials, tests, lesson plans. They got useful critical feedback or support from their peers on the applicability of the materials they have presented. There is a collaborative experience, which is not governed by any institution. They shared links to innovative educational practices from the www as well from their own practice, e.g. new applications of Web 2.0 tools. In addition Ambrois, France have introduced blogs with images, video, audio files for secondary education. It is based on learning French and mastering Web 2.0 for educational needs. It offers huge opportunities for developing all aspects of language competences. In France in primary, lower secondary, upper secondary education and preparation for matriculation exams Le Web pédagogique – the first

francophone bloggers' community which contains quiz, ebooks, videos has been presented. It was used primarily for teachers and school librarians, and other educator. It offers sufficient and diverse pedagogical support to teachers regarding to creating and maintaining a blog. It contains interesting resources on Web 2.0 pedagogy. It offers whole blogs, tests, etc. for all school subjects and levels of school education. It offers examples of blogs used to create international communities of learners (Global good practices of using Web 2.0 in education and teacher training (reviewed)). In University of Warwick (UK) one of the earliest Web 2.0 services at the institutional level has been presented that has been offering its students personal blogs since October 2004. This was undertaken partly in order to see what would happen, and partly to foster a community. The university decided to develop its own blogging system, as there were no commercial systems that met its needs. In particular, they wanted to be able to take advantage of single sign-on and have the ability to integrate the system with other university systems. The blog is widely used, and current statistics give an indication of the take up: 4,540 blogs, 88,619 entries, 13,255 tags, 190,859 comments, 111,803 images (data from 11 April 2007) (Franklin & Harmelen, 2007).

Over 70 million blogs have been created since 2003 and the numbers just keep increasing. People want to express themselves and they like to have an audience. The World Wide Web makes it possible for you to publish your thoughts (or whatever else you would like) and distribute them out to the entire world (of Internet-connected computer users). In addition, this can all be done free. Nowadays, there are several good, reliable blogging tools available for free on the Web. The above examples show differing rationales and differing approaches to implementing Web 2.0 at universities and blogs are just only example of Web 2.0 using in learning process. It's also known best practices of using Facebook, Twitter, Blogger in learning process.

The research in spring 2014 in the Moscow State University of Economics, Statistics and Informatics (MESI) on the use of Internet services in the work of the teacher showed that teachers are active users of Internet services as in professional purposes, as well as in everyday life. Special survey has been made within the limits of this research.

The respondents have been asked the following questions:

1. How often do you use the Internet?
2. For what purposes do you use the Internet?
3. What resources do you use in your professional work?
4. What resources do you use for personal purposes?
5. Specify the types of services that you would like to use?
6. How can you use blogs and websites in a professional activity?
7. How do you feel about participating in professional societies?
8. Do you use professional community during the work with students?
9. Do you use social media in the learning process?

## Internet Services in the Work of University Teacher

Alexey Kozlov et al.

The purpose of the survey was to get an answer to questions such as: how deep the teachers are engaged in the use of advanced Internet services including web 2.0, whether they accept these services in a professional activity or not. Total number of respondents was 209 tutors and 97% of them responded to the first question as follows: “Several times a day”, which has already shown high activity of teachers in the use of Internet services in general.

It should be noted that question about the way of Internet accessing was not included to survey: from mobile or stationary devices. This question is not important, as the work in the Internet services available today from any device connected to the Internet, but still reflects the feature of the modern teacher: often he has not a simple phone for calls but smartphone or tablet with internet connection and the ability to connect necessary resources at a convenient time and in a convenient location.

Very important result of the survey was to obtain a response to second question. 82% of respondents pointed that they use Web 2.0 services for learning that means only one thing: the majority of teachers are information seekers and use modern Internet resources to develop themselves as a professionals.

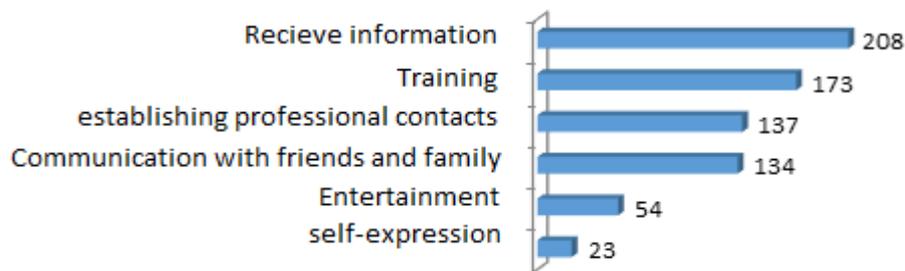


Figure 1. Using the internet for (Stats)

Such teachers are always interested in students, and they can build the learning process more effective by involving students in the decision of not always interesting tasks using creative approaches.

Growth of the teacher from a professional point of view can also be seen in the third question, where respondents have selected Internet resources that they use. The most popular Internet resources used by MESI teachers in professional activities are open encyclopedia (Wikipedia, The Chronicle) and video-hosting (YouTube, RuTube). That means teachers monitor the most popular resources to become familiar with the material available there to be able to give accurate advice where and what kind of material is best to use for the study of his discipline during class with their students. It is also important to note that teachers are also active participants in social networks (LinkedIn, professionali.ru, Vkontakte, Facebook), where they are combined in the community. However, in professional work teachers do not very often use the microblog Twitter, which coincides with the results of a pilot project conducted in the MESI 2010: This online resources are considered to be informative, but not in professional

area and usually using for organization purposes. For example, tutors can quickly combine participants to report important news (change in the schedule or clarification of homework).

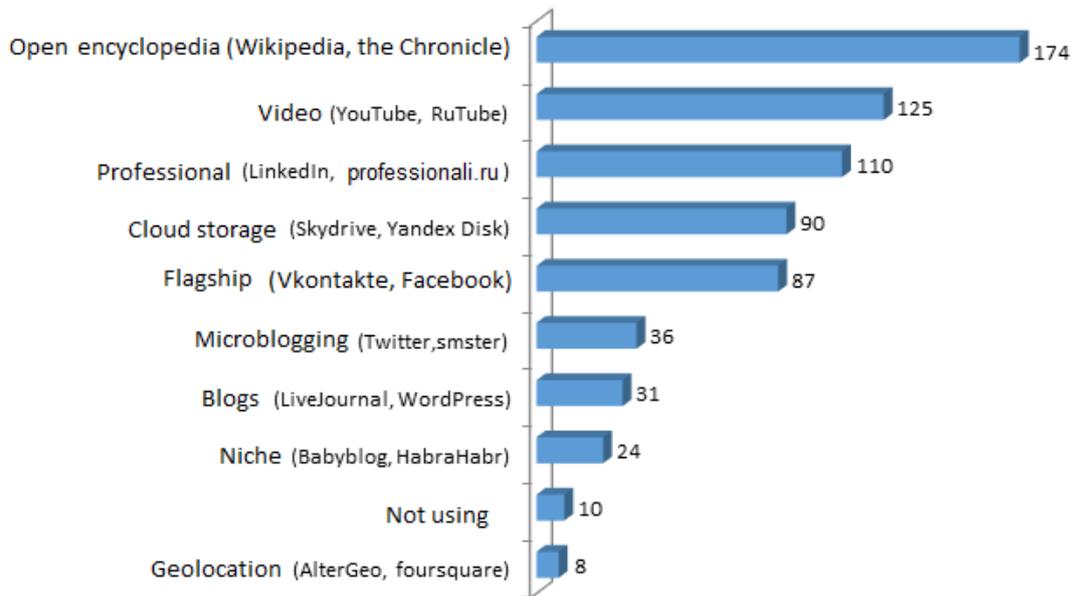


Figure 2. Internet resources used by academic staff MESI in professional activities (Stats)

Main feature of Internet services is that a professional interest in using of Web 2.0 quite often coincides with the personal interest: spending time in Facebook teacher is not only talking with friends, but also discussing different questions in professional societies, receiving relevant and useful information on their discipline, so respondents answered the fourth question same as the third.

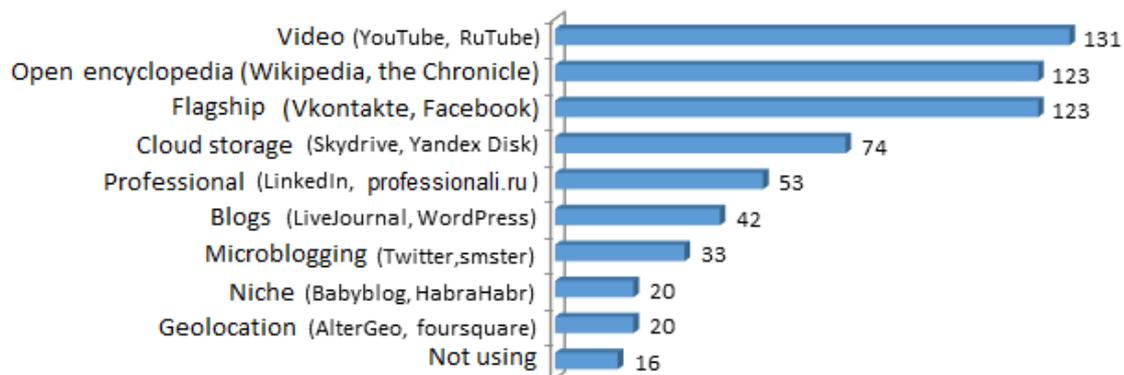


Figure 3. Internet resources used by academic staff MESI for personal purposes (Stats)

Confirmation of mentioned above is in answers to the seven question, where about 70% of the respondents said they were not only aware of the professional societies, but also periodically read them, and 17% of them are active users. In the eighth question about half of the teachers reported that they recommend to students professional communities as sources of useful information for development skills in discipline.

Answers to the fifth question also demonstrate great yearn of teachers to use Internet services in professional life, and here it is possible to trace some differences from answers to the third and fourth question: on the first position we can see professional Internet services (e.g., professional social network LinkedIn, professional.ru). Open encyclopedia (Wikipedia, the Chronicle) and cloud storage (Skydrive, Yandex Disk) are located just on the second place in popularity. Despite the fact that the MESI uses LMS that allows to exchange and share learning materials in a document library, the interest to new instruments unabated. In the pilot project, which was proceeded in 2010, tool for the exchange of documents – Google Drive was also studied, but the result was not very positive: at that moment was not so popular in Russia (and of MESI in particular – just several tutor had accounts there), beside this the service was entirely in English and technical failures not allowed to actively use it. In 2010, teachers and students have chosen LMS MESI, which also had (and is) a tool for sharing files, which did not require to create a separate account, and could trace versioning of published documents with review results from the teacher. To date, cloud storage services came to a more convenient way to use in its development, you can even download special app to your smartphone and be notified about the changes directly to your phone. Therefore, this type of Internet resources has become more attractive for teachers.

Beside this in pilot project that was proceeded in the MESI in 2010 was a question about using of blogs and websites in tutors profession (sixth question). If 4 years ago blogs were considered as tool for self-praise of the teacher, but now teachers themselves read as Russian-speaking as well as foreign blogs and websites for their professional development.

Last question of the survey was about using of Internet services in 2014, concerned the use of social networks in the learning process and about 40% of respondents reported that they use them. Second place was shared by two opposing views: 23% of teachers want to try to use them in the learning process, while 22% do not see any sense. Truth is, most likely somewhere in the middle: there are disciplines that can effectively use social media in the learning process, bringing together students and point them to group tasks in Facebook with elements of the games, while for other disciplines more suited case or personalized with personal discussion in the classroom. In addition, the majority of teachers reported that set of LMS MESI functions satisfy their requirements around the group work with students instead of using social networking as it relates to the additional time for authorization and information search, whereas LMS MESI all clearly structured. But it should be noted that today teachers classify social networks to the category of Internet services as Twitter in 2010, considering them as information resources for urgent alerts students.

Studies on the use of Internet services teachers provide the belief that modern teachers and students become closer and it will allow them to learn effectively, using modern technology in teaching.

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