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

10th EDEN Research Workshop

Towards Personalized Guidance and Support for Learning

10th EDEN Research Workshop

Barcelona, Spain

24-26 October 2018

CONFERENCE PROCEEDINGS

Edited by

Josep M. Duart, András Szűcs
on behalf of the European Distance and E-Learning Network

European Distance and E-Learning Network, 2018

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

10th EDEN Research Workshop
Barcelona, Spain

Published by the European Distance and E-Learning Network

Editors:

Josep M. Duart
András Szűcs

Editorial co-ordination:

Judit Kőműves

EDEN Secretariat, c/o Budapest University of Technology and Economics
H-1111 Budapest, Egry J. u. 1, Hungary
Tel: (36) 1 463 1628, 463 2537
E-mail: secretariat@eden-online.org
http://www.eden-online.org

Conference organised in collaboration with

Supported by the Erasmus+ Programme of the European Union
The publication reflects the authors' view, the EACEA and the European Commission are not responsible for any use that may be made of the information it contains.

ISBN 978-615-5511-25-7

Introduction

High quality research into open learning is indispensable. It provides important information to enhance learning with technologies, improving the learner's experience, to assist effective decision-making, and helps to ensure the viability of products and services. This is vital in a field where change is constant and new innovations arise on a daily basis.

Significant interest from the professional community has clearly confirmed the relevance of the EDEN initiative to run the forum of the bi-annual Research Workshops. The RWSH series represent the meeting place of top European and global research for open learning and draws the map of major trends in the field.

EDEN's 2018 Workshop "Towards Personalized Guidance and Support for Learning" focused on the crucial and changing roles of teachers in supporting student learning in the digital world. This includes the creation of enabling conditions that encourage learning personalization, learner agency and self-direction. Experiences of learner empowerment resulting from balanced "guide on the side" teaching, timely teaching interventions, consistent feedback and feedforward, explicit teaching of learning-to-learn strategies, assessment for learning, and technology-based adaptive teaching provided substantive background for reflection and discussion.

Research topics of interest included: Personalized learning: accompanying learners while addressing distinct learning needs, situations or preferences – Teachers' and learners' roles: rethinking teaching facilitation strategies using the potential of digital technologies – Open education: making the most of openness to ensure student success – Adaptive teaching: enhancing teacher decisions through course analytics and course awareness methodologies – Formative assessment: assessment for learning and the implementation of complementary approaches – Feedback: reinforcing teacher-learner dialogue through different channels in networked environments.

The tradition of awarding the "EDEN Best Research Paper" will be continued. The selection process takes place in collaboration with the Ulrich Bernath Foundation for Research in Open and Distance Learning. In 2018, the 10th Anniversary of this movement has ben celebrated. The Foundation also supported five young scholars with grants for successfully submitting a conference paper to be presented in Barcelona in 2018.

A PhD Student Symposium was organised the day before the Research Workshop, hosted by the Universitat Oberta de Catalunya (UOC), with the participation of 30 young scholars. The Symposium has been designed to foster the exchange of experiences and knowledge among doctoral students doing research in the area of the event's theme, while providing a discussion forum for the advancement of doctoral research. The Symposium was led by a panel of international experts on e-learning.

Higher Education is changing in nature. The new way of thinking, shaping a new paradigm is based on modularization. In this paradigm, the vision of personalized pathways of higher learning, qualifications and certification is manifested. In frames of the RWSH10, the OEPass Multiplier Event was organised, as initiative of the Open Education Passport project on the topic of micro-credentials, a timely and relevant concept in higher education and adult learning.

András Szűcs
Secretary General,
European Distance and E-Learning Network

Professor Josep M. Duart
Universitat Oberta de Catalunya (UOC)

Acknowledgement and thanks are given to the Programme and Evaluation Committee

Conference Chairs:

Airina Volungeviciene, EDEN President, Director of Innovative Studies Institute at Vytautas Magnus University, Lithuania;

Josep Maria Duart, Universitat Oberta de Catalunya, Spain

Francesco Agrusti, University Roma III, Italy;
Diana Andone, eLearning Center, Romania;
Deborah Arnold, Universitat Oberta de Catalunya, Spain;
Quelic Berga Carreras, Universitat Oberta de Catalunya, Spain;
Ulrich Bernath, Ulrich Bernath Foundation for Research in ODL, Germany;
Lisa Marie Blaschke, Carl von Ossietzky University of Oldenburg, Germany;
Mark Brown, National Institute for Digital Learning, Dublin City University, Ireland;
Nati Cabrera, Universitat Oberta de Catalunya, Spain;
Elena Caldirola, University of Pavia, Italy;
Helga Dorner, Central European University, Hungary;
Ulf-Daniel Ehlers, DHBW, Germany**;**
Kurt Galle, VIVES University, Belgium;
Iolanda Garcia Gonzalez, Universitat Oberta de Catalunya, Spain;
Lourdes Guardia, Universitat Oberta de Catalunya, Spain;
Teresa Guasch, Dean of the Faculty of Phsychology and Education Sciences, Universitat Oberta de Catalunya, Spain;
Montse Guitert, Universitat Oberta de Catalunya, Spain;
Sandra Kucina Softic, University of Zagreb, Croatia;
Marcelo Fabian Maina, Universitat Oberta de Catalunya, Spain;
Mark Nichols, The Open University, United Kingdom;
Ebba Ossiannilsson, Swedish Association of Distance Education, Sweden;
Antoni Perez-Navarro, Universitat Oberta de Catalunya, Spain;
Antonella Poce, University Roma III, Italy;
Juliana E. Raffaghelli, Universitat Oberta de Catalunya, Spain;
Timothy Read, UNED, Spain;
Maria Rosaria Re, University Roma III, Italy;
Albert Sangra Morer, Universitat Oberta de Catalunya, Spain;
Andras Szucs, EDEN, United Kingdom;
Ferenc Tatrai, EDEN, United Kingdom;
Leen Thys, VIVES University, Belgium;
Sylke Vandercruysse, VIVES University, Belgium;
Delphine Wante, VIVES University, Belgium.

TABLE OF CONTENTS

MOOCS

LEARNER NEEDS, ATTITUDES, BEHAVIOUR

EDUCATIONAL SYSTEMS

OPEN EDUCATION

TEACHER TRAINING AND COMPETENCES

ASSESSMENT

METHODOLOGY

THEORY

SOCIO-CULTURAL-ECONOMIC

POSTERS

Towards Personalized Guidance and Support for Learning
Proceedings of the 10th European Distance and E-Learning Network Research Workshop, 2018
Barcelona, 24-26 October, 2018
ISBN 978-615-5511-25-7

EDEN 10TH RESEARCH WORKSHOP CONTRIBUTION TO RESEARCH IN OPEN AND DISTANCE LEARNING

Including Summarising Statements, Challenges Raised and Recommended Actions

Preamble

We, members of an enlarged international community of researchers concerned with education and the digital world, met in Barcelona at the EDEN 10th Research Workshop, from 24 to 26 October 2018, to discuss the rapidly changing teaching practices and the transformation of teacher roles and identity.

- Acknowledging the pivotal role of teachers in the intersection between transformative European and global educational policies, increasing drive towards the use of technology, and student demand for authentic learning.
- In alignment with EDEN's aim of fostering "developments in open, distance, flexible and e-learning providing a platform for all the regions and countries of Europe for cooperation and collaboration between institutions, networks companies and other agencies in the field" as well as "links with non-European associations and institutions".
- Committed to the 2015 Incheon Declaration "Education 2030: Towards inclusive and equitable quality education and lifelong learning for all" highlighting the need to "ensure that teachers and educators are empowered, adequately recruited, well trained, professionally qualified, motivated and supported within well-resourced, efficient and effectively governed systems."
- Endorsing the 2016 "Teachers for Education 2030: México Declaration" of the 8th International Policy Dialogue Forum – International Task Force on Teachers reaffirming the central role of teachers in the Education 2030 agenda.
- Following the recommendations of the 2014 High Level Group on the Modernisation of Higher Education report to the European Commission "New modes of learning and teaching in higher education" emphasizing that "methods of teaching can be better tailored to individual students' needs and advances in learning analytics are enabling quicker feedback on students' performance."
- Following the concrete issues raised in the mandate of the High Level Group on Education and Training DGs ET2020 Working Group on Digital Education: Learning, Teaching and Assessment (DELTA), namely, "digital competences at all levels of learning, transparency, quality assurance, validation and recognition, as well as promoting the use of ICT with the view to increasing the quality and relevance of education at all levels".

We promote, as conclusions of the EDEN research workshop regarding *the crucial and changing roles of teachers in supporting student learning in the digital world*, the adoption of the following actions based on identified statements and challenges.

1. Personalized Learning: Accompanying Learners while Addressing Distinct Learning Needs, Situations or Preferences

Statement

Personalization and adaptive teaching result in a productive combination of teachers supporting students' particular needs and reinforcing students' aptitudes. A whole set of learning and assessment methodologies enabled and enhanced by flexible and powerful technologies provide opportunities for more focused teaching tailored to students' prior knowledge, skills and achievements, their interests and their expectations.

Challenge

Most educational models rely on cohorts, understood more or less as homogenous groups sharing similar and general characteristics. But the classroom or the course is a space where teachers must be conscious of individual students' distinct learning needs, interests, aspirations, and cultural backgrounds. Managing groups and individuals, handling diversity, supporting different learning paths, providing rich-interactive learning resources, and administering timely feedback and assessment requires not only a skilful teacher but also an institutional commitment to support a substantive organizational transformation.

Actions

This could be achieved through the following actions:

1.1. Develop teacher awareness on the importance of knowing students' personal traits and interests for learning engagement and success.

1.2. Facilitate teachers with relevant information regarding student diversity with a focus on situations requiring special attention.

1.3. Provide teachers with opportunities for learning about methodologies that encourage student agency through self-regulation and self-direction.

1.4. Encourage teachers in the adoption of approaches integrating professional and workplace learning to the curriculum.

1.5. Promote teacher coordination in a joint effort for the development of 21st century skills.

1.6. Support teachers with flexible, usable, and accessible technologies for (individual and group) student guidance, communication and assessment.

1.7. Make available an integrated, usable and robust technological infrastructure supporting ongoing course and programme monitoring and tracking consistent with data protection regulations.

ISBN 978-615-5511-25-7

1.8. Produce readable information through learning analytics supporting the student learning process and achievements while ensuring student privacy.

1.9. Guide teachers' decisions with filtered and relevant data about student and course progress in accordance with ethical considerations.

1.10. Involve institutional leadership, key stakeholders and departments in a cross institutional effort for student retention, success and satisfaction.

2. Open Education: Making the Most of Openness to Ensure Student Success

Statement

Open education goes beyond the production and use of OER (Open Educational Resources). It is linked to the distributed and networked structure of knowledge in the digital age, as well as to the collaborative, flexible and sharing nature of social networked environments as potential learning contexts.

Challenge

Voices in the open education movement privilege a model of autonomous and self-directed OER / OEP (Open Educational Practices) based learning. In contrast, institutional priorities often focus more on issues of assessment and accreditation, neglecting opportunities for moving towards a model of independent, self-directed and self-assessed learning. There is thus a need to redefine teaching policy and practice in an open paradigm, to make the most of new learning architectures and ecologies, while ensuring learning quality and accessibility.

Actions

This could be achieved through the following actions:

2.1. Empower teachers to adopt open approaches in their daily work to enrich the teaching and learning experience, through understanding and embracing open values, developing an open online identity and mobilising online opportunities for social and peer-to-peer networking, collaboration and shared practice.

2.2. Develop an open pedagogy by addressing the following four interrelated dimensions:

2.2.1. Opening up learning (co)design: sharing and reflecting on ideas, theories and plans about curriculum, courses, learning activities, learning technologies, etc. with colleagues, experts and students.

2.2.2. Opening up content: producing resources with open licenses, facilitating their sharing through OER repositories and other means, adapting, assembling and using OERs produced by others.

2.2.3. Opening up teaching: fostering the co-creation of public knowledge by and with students, through online and offline collaboration and networked communities.

ISBN 978-615-5511-25-7

2.2.4. Opening up assessment: implementing practices such as collaborative, peer and self-assessment, as well as external social feedback; but also through recognition of expertise and competence with the use of tools such as open badges and e-portfolios and taking into account informal and prior professional learning.

2.3. Conduct research on the most appropriate theoretical foundations for the design of open teaching and learning practices and environments, with particular focus on effectiveness and scalability with respect to learning support and engagement, especially in massive contexts such as MOOCs.

3. Teachers and Learners' Roles: Rethinking Teaching Facilitation Strategies Using the Potential of Digital Technologies

Statement

Teaching in higher education and vocational training institutions should embrace and integrate learners' differences, interests and needs putting the emphasis on student-centred learning, rather than teacher-centred teaching. Students need to develop competences to become lifelong learners who are able to engage in self-directed learning across boundaries of formal and informal settings and communities. Digital technology can facilitate a shift towards a more participatory pedagogy which fosters learners' autonomy by supporting a diversity of communication modes and the development of online learning communities.

Challenge

However, there is wide consensus that ICT continues to be primarily used to support traditional teaching practices, rather than fundamentally transforming them from the pedagogical point of view. Effective teaching today requires being able to engage the learner in the social process of knowledge development by taking full advantage of the possibilities offered by digital technologies and networks. Technology may help to rethink teaching and curriculum itself in order to create learning experiences and projects that are more participatory, flexible, authentic and interdisciplinary.

Actions

This could be achieved through the following actions:

3.1. Become a networked teacher by mobilising the potential of digital technology and social networks to improve teaching practice and to build social capital among diverse kinds of students.

3.2. Design an evidence-based framework for learning where learners can actively contribute with their ideas, discussions and connections from peripheral fields and contexts.

3.3. Establish a learning contract with learners, making clear the goals and expectations and allowing them to participate in the creation of their own

ISBN 978-615-5511-25-7

curriculum, encouraging them to make choices as autonomous agents within the learning process.

3.4. Build and maintain learning environments that are meaningful to students and which support social interaction and learner regulation and autonomy.

3.5. Give and enable frequent and timely support and feedback to learners, staying present and playing a co-regulatory role.

3.6. Engage in reflective and inquiry-led practice, taking into account context and student needs, and identifying critical issues and opportunities for change and development.

3.7. Support and engage in dialogues to forge connections with students, creating partnerships with them to advance teaching and learning processes.

3.8. Participate in teachers' communities of practice and/or informal networks for professional development.

4. Assessment for Learning: Reinforcing Teacher-Learner Dialogue through Feedback and the Implementation of ipsative Approaches

Statement

Formative assessment and feedback consider that the implementation of complementary *ipsative approaches* and the reinforcement of teacher-learner dialogue through different channels in networked environments enhance learning.

Challenge

Formative assessment refers to the continuous assessment of student progress in order to identify learning needs and strategies, and to adjust teaching in accordance. Learners can benefit from useful feedback and appropriate formative assessment, but do not always take sufficient advantage of this. Furthermore, a focus on high visibility summative tests (e.g. exams) creates frictions with more classroom-based formative assessment approaches, and a lack of connection between systemic and classroom approaches to assessment.

Actions

This could be achieved through the following actions:

4.1. Learn how to design and implement different assessment approaches: defining the purpose (diagnostic, formative and summative); establishing who "performs" the assessment; selecting the appropriate methods and instruments; choosing the appropriate tools; considering the implications of different certification contexts (traditional degree-awarding programme, open and flexible MOOC context, micro-credentials etc.).

4.2. Provide feedback as a strategy to encourage reflection and dialogue, not only between the teacher and student but also among students themselves.

ISBN 978-615-5511-25-7

4.3. Focus on feedback as a process, emphasizing not only the information about the learning process but also actions to be carried out in future tasks (feedforward).

4.4. Help students develop self-regulation strategies by identifying their own expectations and making decisions to improve their learning.

4.5. Integrate appropriate feedback when designing interactive assessment assignments (quizzes etc.) to support learners' awareness of their own progress.

4.6. Use data from formative assessment to adapt teaching approaches with a view to meeting diverse students' needs.

4.7. Promote ipsative approaches which compare students' results with previous achievements, enabling them to see whether or not they have implemented recommendations and feedback received previously.

4.8. Implement and evaluate the effectiveness of different methods, such as gaming, portfolios or journals, for dynamic formative assessment.

4.9. Use Learning Analytics systems to support the assessment process, in particular tracking learners' progress over several learning activities.

ISBN 978-615-5511-25-7

Towards Personalized Guidance and Support for Learning
Proceedings of the 10th European Distance and E-Learning Network Research Workshop, 2018
Barcelona, 24-26 October, 2018
ISBN 978-615-5511-25-7

DESIGNING A NEW GENERATION MOOC FOR UNDERGRADUATE MATHEMATICS

Geoff Woolcott, Raina Mason, Carolyn Seton, Southern Cross University, Australia

Summary

This paper outlines the development using a design-based implementation research (DBIR) approach of a *new generation* massive open online course (ngMOOC) using two innovations: (a) a basis in the human cognitive architecture outlined in cognitive load theory; and (b) point-of-contact feedback that investigates student learning as a process. This preliminary analysis suggests that the DBIR approach supports theoretical standpoints arguing for an understanding of how design for optimal learning can utilise conditions, such as differing online or blended educational contexts, in order to be effective and scalable. The ngMOOC development outlined offers the groundwork for use of adaptive systems that cater for learner expertise and the DBIR approach offers a framework that seems especially useful in constructing and developing online learning that is both self-paced and curriculum based.

Introduction

Massive open online courses (MOOCs) have become increasingly popular in the modern educational world, providing opportunities for learners to develop and test their own learning networks in online environments (Chen et al., 2017). There are challenges for learning design and development, however, inherent in the divergence between collaborative (cMOOC) and course-based (xMOOC) offerings, including the lack of input from learners in design and development, as well as more general factors, such as motivation, participation and study time (Hew, 2015). The quality of MOOC offerings has also been questioned with regard to learning and cognition, with calls for instructional design that is based in human cognitive architecture (Chen et al., 2017).

This article addresses some of these challenges by outlining the design and development of a new generation MOOC (ngMOOC) as a focal problem of practice for application in an instructional setting related to undergraduate mathematics. A design-based implementation research (DBIR) approach (Penuel et al., 2016) was utilised in the design and development, underscored by two important innovations: (a) a basis in the well-established human cognitive architecture outlined in cognitive load theory; and, (b) point-of-contact student feedback based in a well-tested online system dedicated to investigating student learning as a process. This follows recent MOOCs in which design-based research was used to successfully reframe MOOC construction, for example, in scaling problem-based learning (Verstegen et al., 2016).

Study Context

A persistent problem in undergraduate mathematics

An increasing number of graduates in higher education do not have the requisite mathematics knowledge and skills that the modern industrial workforce requires. There has been on-going discussion regarding the need for a rethink and redesign of mathematics teaching and learning at the university and college level in order to cater for the weak mathematics foundation of some university students (Australian Academy of Science, 2016). The ngMOOC was developed within the project, "Bite size maths: Building mathematics capability of low SES students in regional/remote Australia" (BSM), to provide online resources to support undergraduate mathematics and academic numeracy. The project established the foundations for a change in the way that online education is offered across six study universities located in regional Australia and offering online or blended education across multiple campuses. These universities, like many regional institutions, all have a substantial proportion of students with little or no mathematics background or who have completed schooling more than 10 years ago (Australian Academy of Science, 2016). The ngMOOC aimed to optimise the outcomes for students not prepared for the level of quantitative skill needed in their university program.

Design-Based Implementation Research (DBIR)

The ngMOOC development can be described in terms of the principles of DBIR: four principles take up the issue of collaborative research and practice that involves multiple stakeholders in a process that aims to design, test and implement innovations through an iterative functionality (Fishman et al., 2013; p.136):

1. a focus on persistent problems of practice from multiple stakeholders' perspectives;
2. a commitment to iterative, collaborative design;
3. a concern with developing theory and knowledge related to both classroom learning and implementation through systematic inquiry; and,
4. a concern with developing capacity for sustaining change in systems.

Human Cognition and Student Feedback

In combining human cognition and student feedback, the ngMOOC draws together two comprehensive research fields, human cognitive architecture and point-of-contact feedback, each field well established in its own right but rarely combined in a single learning context.

Human Cognitive Architecture and Cognitive Load Theory

Human cognitive architecture is concerned with the organization of the structures, functions and processes that allow each person to learn, think and solve problems associated with the biologically secondary knowledge that is central to instructional design rather than the biologically primary knowledge obtained naturally and effortlessly, without instruction (Sweller et al., 2011). A key feature of human cognitive architecture is described in cognitive load theory as comprising a limited working memory, which can only deal with a small

ISBN 978-615-5511-25-7

amount of new information at a time, and a long-term memory, which can hold an unlimited number of elements (schemas) on a relatively permanent basis (Sweller et al., 2011).

Over the past 20 years a number of researchers have undertaken research on human cognitive architecture to better understand what aspects support problem solving and learning, noting that human cognitive architecture and effective instructional design are inseparably intertwined (Sweller et al., 2011). Sweller's cognitive load theory has become one of the most cited learning theories in contemporary educational design and is critical to the success of all forms of computer-based instruction (Chen et al., 2017). Cognitive load theory has provided a set of guidelines for instructional design that are predicated on an understanding of human cognition. Comprehensive testing of these principles has given rise to cognitive load effects that can be applied in a number of different learning modalities to improve learning.

The ngMOOC discussed in this paper was designed with the principles of cognitive load theory in mind, and three cognitive load effects form the basis of the MOOC construction: the worked example effect; the modality effect; and, the problem completion effect (Sweller et al., 2011). The ngMOOC takes up reports that the use of video podcasts for learning appears to have a positive effect on student performance. However, since such reports leave open the question as to the nature of what constitutes an adequate design for interactive podcasts that are effective for student learning (Chen et al., 2017), the ngMOOC used cognitive load theory as a conceptual basis for their construction and use.

Point-of-contact feedback and student learning

Point-of-contact feedback is an essential component of student learning that allows educators to make changes to unit content to better accommodate student needs. Such feedback serves to let students know about different learning approaches, providing guidance on which may be most appropriate in particular contexts, and allows feedback from the students on how well the instructional design has facilitated their learning. In recent times an updated version of the Study Process Questionnaire (SPQ) of Biggs and colleagues (Biggs et al., 2001) has been used as point-of-contact feedback to measure deep and surface learning approaches in undergraduate education contexts, demonstrating the superiority of deep learning (Lake et al., 2017). The ngMOOC utilises research showing that feedback for students about their learning approaches, motivations and strategies, as point-of-contact feedback, can be successfully embedded in online course delivery for undergraduate students (Lake et al., 2017).

Method

The project was iterative, undertaken in two phases, with a Phase 1 pilot program undertaken in 2016 and with Phase 2 as a following through to 2019. The two Phases were examined as embedded case studies within the DBIR context using mixed methods approaches. Project partners, 24 university mathematics and education experts across the six study universities, co-created a baseline data set via a review of national database statistics on disadvantage in regional education, as well as surveys and semi-structured interviews. Several face-to-face meetings of experts at the trial university provided valuable feedback about responses to

ISBN 978-615-5511-25-7

Phase 1, and this was used as part of co-creation and development of the ngMOOC construction and evaluation in Phase 2. Student feedback was also utilised, in both phases.

Phase 1: Co-Creation, Development and Evaluation of Five Online Modules

This pilot phase was conducted using five modules in an online learning system (OLS) within a one-semester introductory mathematics subject at a single university. Volunteer participants were randomly assigned to either a treatment group or a control group on alternate modules, with the treatment group receiving two pairs of worked examples and practise tasks in a *snippet*, a total of ten pairs for the five snippets in each module. The participants in the control group were presented with two pairs of tasks that were identical to the questions in the worked examples and practise tasks of the treatment group (and of identical duration), but with no worked examples provided. The post-tests provided a total of 30 randomized multiple-choice tests for each participant in each module, allowing a determination of learning effectiveness comparable with the subject pre-test and exam. Data included: the number of participants attempting modules/snippets; the number of attempts at module/snippet completion; online cognitive load surveys in each snippet; post-tests; and, feedback from open comment boxes. The use of the OLS allowed researchers to collect data from a participant's initial attempts (ignoring those subsequent), since the modules were designed for interactivity and repeated use.

Phase 1: Co-Creation, Development and Evaluation of the ngMOOC

Data analysis from the Phase 1 pilot informed the development and subsequent construction of the Phase 2 ngMOOC, which comprised 20 interactive modules for use together or independently on a web hosting service. An overall aim was to be able to embed single modules, as interactive online podcasts, or embed the entire 20 modules as the ngMOOC—a novel learning approach in university mathematics programs. These 20 modules continued the Phase 1 focus on cognitive load theory's design principles, with the addition of the completion effect in the form of faded worked examples (Figure 1), but with no control groupings.

The looped pathways within modules combined with online rapid assessment allowed the introduction of several enhanced features based on Phase 1 trials, including: addition of point of contact (POC) feedback and the study process questionnaire (SPQ); addition of both module and snippet pre-tests; a repeat option for students with post-test score of less than 2; addition of faded worked examples as a *second loop* option for students with post-test test scores from 2 to 5 (to avoid imposing high level of extraneous load during subsequent learning); an out option for students with high expertise (pre-test scores of 10 for a module and 6 for a snippet) enabling those with high levels of expertise to skip modules or snippets; and, the choice to do modules in any order. Additional changes involved: print (rather than handwriting); continuation of animation in delivery; and, no duration limits within modules/snippets.

ISBN 978-615-5511-25-7

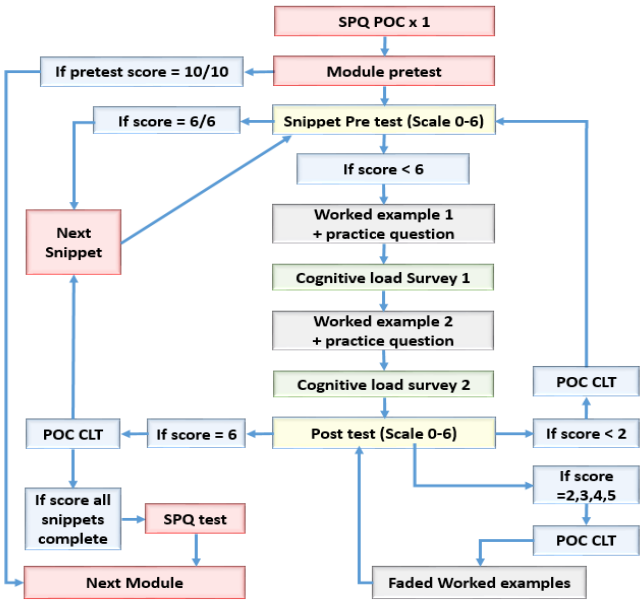


Figure 1. An outline of the common structure each module of the ngMOOC

Results and Discussion

Collaboration around persistent problems of practice and multiple stakeholder perspectives

Given the persistent problems related to undergraduate students struggling with introductory mathematics, the ngMOOC team acted in full awareness of the need for all stakeholders to have a say in how the project progressed, including via feedback at various stages of design, development and trialling. Multiple stakeholders in the university staff and student community were made aware of project goals and timelines and partner objectives localised to the needs of their own university environment (i.e., in undergraduate mathematics). As a result, the Phase 1 trial emerged from the collaborative workings of core group interactions with other stakeholders as recorded in meeting notes, journals and minutes. Phase 1 was conducted at a single university, for example, based on a collaborative team decision as a way of staying within the timeframe of the project goals. The team was able to draw on expertise from previous collaborations, and to coordinate a further focus on the persistent mathematics problem by using feedback from Phase 1 in the scaling up and refinement processes undertaken in Phase 2.

A commitment to iterative, collaborative design

In the early design and development of trial modules, the team decided that an iterative design provided effective teaching and learning values of the *usable tool* through efficiency in use of resourcing on a limited budget. Coincidentally, the ngMOOC and module structures were also iterated internally for construction efficiency and to allow for incremental learning capability. Collecting evidence during and after process iteration is typical of the DBIR process, but in this case included the enhanced capability provided by feedback from the Phase 1 trials. Iterative design is not necessarily a good option for single use MOOCs, but in both Phases, designers and learners engaged in co-designed and co-created research-practice

ISBN 978-615-5511-25-7

partnerships involving people in the design of their own learning, fully consistent with an application of DBIR in the MOOC context (Penuel et al., 2016). Within iterations, the collaborative partnerships drew on considerable in-kind support in terms of commitment to group meetings, review of processes and materials, and semi-structured interviews and surveys, allowing the budget to be directed to script writing and online production with a few dedicated staff. Module design was taken back to partners at workshops and focus groups to ensure that the modular process trialled in Phase 1 could be scaled up as the ngMOOC of Phase 2. This stakeholder feedback ensured also that the content of the online modules was fit for purpose and graduated for the incremental learning necessary for long-term memory gains (Hew, 2015).

A concern with developing theory and knowledge related to both learning and implementation through systematic inquiry

The combination of theories in the ngMOOC required a systematic approach in order to first determine the effectiveness of the key cognitive load effects being implemented, primarily the worked example and modality effects, and then to include the point-of-contact feedback in combination with these and the problem completion effect. The project strategy, therefore, was to first trial five modules to ascertain how the well-studied worked example effect could inform module design in interactive online podcasts. Phase 1 trial analysis favoured the worked example effect, although there was insufficient data for a significant treatment effect to be proven (due to confounding of zero scores and post-test non-completions). Phase 2 was informed by the high dropout rates in Phase 1, characteristic of MOOCs, suggesting a larger student samples in Phase 2 trials. Greater content coverage was also indicated since Phase 1 subject results (and not the modules) were inconclusive in determining the effect of the five trial modules. Feedback from Phase 1 trials indicated also that system delivery needed to be fully automated and accessible through a widely accessible internet portal (as instituted in Phase 2) rather than an internal university OLS.

Both the SPQ and POC have been trialled previously at the study university and were shown to enhance the student experience while at the same time providing research data from students about learning approaches that had not previously been utilised by university teachers (Lake et al., 2017). In Phase 2 the SPQ was placed in the course introduction and at the end of each module. Although this was to provide comparative data to researchers as to whether the student motives (deep or surface) had altered during the module, students thus far have been reluctant to engage with the post-trial SPQ. Of those students who attempted the initial SPQ, surface learning processes predominated and these students did not feel that the modules were going to be of benefit for deep learning. Further data collection may give a clearer picture of how the SPQ and other POC is contributing to student learning processes.

A concern with developing capacity for sustaining change in systems

Sustainable system change was not an obvious goal in initial planning or in Phase 1. This phase did, however, rely on team members who, as individual implementers, brought significant skills and expert knowledge to the project, in terms of discipline content, awareness

ISBN 978-615-5511-25-7

of regional student education, professional expertise, mentoring ability and project management. In the BSM project, therefore, people worked together on common goals, building on a network of prior relationships, as well as drawing upon the elements of cohesion and mutual respect available from newer team members, as attributes of interdisciplinary teams. As a result, there were clear flows of communication and systematic and structured approaches that were mentored by experienced researcher who understood their own capabilities and those of their research partners. In the longer term, the Phase 2 project may influence system change through its novel approaches within a human cognitive architecture as well as through its initiation of sustainable feedback. This, in turn, will enable individuals and teams working in introductory university mathematics units to contribute to development of this new learning system, while at the same time increasing their own capabilities in online mathematics learning. In order for this to happen, each university may benefit from supporting collaborative involvement of both teachers and learners in sustainable system development.

Conclusion

MOOCs continue to offer universities a way to provide educational outcomes that are based in learner needs while remaining within a prescribed curriculum. The ngMOOC development outlined here is a beginning for the adoption of a cognitive architecture in conjunction with feedback systems that offers the groundwork for use of adaptive systems that cater for learner expertise. DBIR offers a framework that seems especially useful in constructing and developing online learning that is self-paced and curriculum based.

References

1. Australian Academy of Science (2016). *The mathematical sciences in Australia: A vision for 2025.* Canberra, Australia: Australian Academy of Science.
2. Biggs, J., Kember, D., & Leung, D. Y. (2001). The revised two-factor study process questionnaire: R-SPQ-2F. *British Journal of Educational Psychology, 71*, 133-149.
3. Chen, O., Woolcott, G., & Sweller, J. (2017). Using cognitive load theory to structure MOOCs and other computer-based learning. *Journal of Computer Assisted Learning.* doi:10.1111/jcal.12188.
4. Fishman, B. J., Penuel, W. R., Allen, A. R., Cheng, B. H., & Sabelli, N. O. R. A. (2013). Design-based implementation research: An emerging model for transforming the relationship of research and practice. *National Society for the Study of Education, 112*, 136-156.
5. Hew, K. F. (2015). Promoting engagement in online courses: What strategies can we learn from three highly rated MOOCs. *British Journal of Educational Technology, 47*, 320-341.
6. Lake, W., Boyd, W., Boyd, W., & Hellmundt, S. (2017). Just another student survey? Point of contact survey feedback enhances the student experience and lets researchers gather data. *Australian Journal of Adult Learning, 57*, 82-104.

ISBN 978-615-5511-25-7

7. Penuel, W. R., Fishman, B. J., Cheng, B. H., & Sabelli, N. (2016). Organizing research and development at the intersection of learning, implementation, and design. *Annual Review of Policy Design, 4*, 1-10.
8. Sweller, J., Ayres, P., & Kalyuga, S. (2011). *Cognitive load theory.* New York, NY: Springer.
9. Verstegen, D. M., Spruijt, A., Dolmans, D., & van Merriënboer, J. J. (2016). Problem-based learning in a MOOC – Exploring an innovative instructional design at a large scale. *Proceedings of the 8th International Conference on Computer Supported Education – CSEDU, Volume 2*, 369-377. doi: 10.5220/0005757003690377

ISBN 978-615-5511-25-7

Towards Personalized Guidance and Support for Learning
Proceedings of the 10th European Distance and E-Learning Network Research Workshop, 2018
Barcelona, 24-26 October, 2018
ISBN 978-615-5511-25-7

OSCAR AND NIAMH TWO MOOC ANIMATION ROBOTS: HOW DID LEARNERS RESPOND?

Sally Mhic Dhomhnaill, Mairéad Nic Giolla Mhichíl, Dublin City University, Ireland

Summary

There has been an increased shift in the use of digital technologies as educators recognise the many benefits in pedagogy that these technologies provide. With learning occurring within a social context and higher cognitive activity taking place from social interactions, educators are building relevant opportunities for learners to interact not only with content but also with the instructor and other learners (Dunlap & Lowenthal, 2009; Vygotsky, 1978). The purpose of this study was to explore learner responses to the integration of two animation robots in a language learning MOOC. The literature relating to learning in MOOCs indicate that student engagement is a prerequisite for online learning and that social, cognitive and teacher presence leads to increased engagement levels (Hew, 2016; Garrison, Anderson, & Archer, 2000). Data was analysed from the course statistics and comments of a language MOOC titled Irish101: Introduction to Irish Language and Culture and four distinct themes emerged in capturing engagement levels of learners: course content, technical assistance/how to do support, recommendations/sharing of resources and course facilitators/course itself. The findings indicate a good response by learners within the MOOC and it they also underpin the importance of teacher presence to support learners (Kop & Fournier, 2011)

Introduction

Digital technologies are increasingly used in higher education due to the many benefits these technologies provide in teaching and learning such as increased engagement levels and greater cognitive activity (Dunlap & Lowenthal, 2009; Vygotsky, 1978). The last decade also shows an increase in the attention being given to gamification in learning, also referred to as game-based learning (Wouters & van Oostendorp, 2013). de Freitas (2017) found in her research that games when viewed from an educational perspective and often referred to as Technology Enhanced Learning are effective learning tools that engage learners, enhance motivation and are associated with behavioural change. Massive Open Online Courses (MOOCs) are online courses which attract substantially larger audiences than traditional online education. MOOCs are free and open to all and provide interactive forums that help learners engage with each other and with their educators (Conole, 2013). While student engagement is a necessity for learning online, one of the challenges in teaching MOOCs is engaging students due to the large and diverse body of learners as well as the lack of instructor accessibility (Hew, 2016). According to Garrison, Anderson, and Archer (2000), there are three interconnected forms of presence that increase engagement levels of online learners: social, cognitive, and teaching

presence. Social presence relates to learners' affective responses or feelings towards their peers. Cognitive relates to learners' thinking and points of view through communication with others while teaching presence relates to the design and facilitation of the course. Jung and Lee (2018) found in their studies that teacher presence has a direct effect on learner engagement in MOOCs and highlighted the importance of instructional design and direct facilitation and feedback. Kop and Fournier (2011) in their research on emergent technologies influencing the design of learning environments concluded that meaningful learning occurs if social and teaching presence forms the basis of course design, facilitation and the direction of cognitive processes. They went on to emphasize that the teacher as facilitator needs to be persistently present as well as dynamic and change throughout the course.

Background

Irish101: Introduction to Irish Language and Culture Massive Open Online Course (MOOC) was launched and run by Dublin City University in early 2018 on the FutureLearn platform. The MOOC is co-funded by the Irish Government's Department of Culture, Heritage and the Gaeltacht under the Twenty-Year Strategy for the Irish Language with support from the National Lottery. The MOOC titled Introduction to Irish Language and Culture is a Language MOOC (LMOOC) developed for beginner level learners of the Irish language globally. The goal of the LMOOC is to provide learners with the basics to help converse in the Irish language as well as an introduction to Irish culture and ran over three weeks. To facilitate learning and support during each week of the course run an end of week section titled Questions of the Week formed an integral part of the course design. Learners were able to post questions to this section about course content and two animation robots called Oscar and Niamh were created and served as course facilitators to answer the more frequently asked questions posed by learners as well as providing general guidance by featuring in a weekly cloud-based animated video which was uploaded late Friday afternoons for learners to view. Questions that didn't appear in the animation were also individually answered by Oscar and Niamh

Methodology

The research was exploratory in nature and involved analysing discussion comments data generated by learners following a weekly FAQ video posted by the animation robots in the MOOC. A total of 554 comments were collated and the breakdown can be seen in Table 1.

Table 1: Number of course comments in the Question of the Week sections by week in Irish 101

Week	Number of comments
1	284
2	156
3	114

A thematic analysis of the comments was conducted to form patterns and identify themes by the researchers, each of these was cross-checked, four distinct themes emerged. The first theme related to comments specifically about course content. The second theme revolved

ISBN 978-615-5511-25-7

around technical assistance including how to do questions related to the course. The third theme consisted of recommendations and sharing of useful resources while the fourth theme were comments about the course facilitators and the overall course itself as shown in Table 2.

Table 2: Comments by theme for Weeks 1-3

Comments	Week 1	Week 2	Week 3	Total
Course Content	112	61	25	198
Technical Assistance /How to do	47	20	2	69
Recommendations/Sharing of Resources	54	27	9	90
Course Facilitators and Overall Course	34	35	73	142
Other	37	13	5	55

The weekly videos featuring Oscar and Niamh answering more general questions learners had each week also showed a high number of views as shown in Table 3 with an equally high percentage of those learners viewing the videos in their entirety.

Table 3: Video views per week

Video views	Total video views by learners	% of learners who viewed 100% of the video
Week 1	2192	57%
Week 2	1314	58%
Week 3	910	63%

Theme 1: Course Content

There were 198 comments related to course content with the majority of these comments i.e. 112 made in Week 1. These comments related to specific questions about the language element of the course e.g.

> *"Hi Oscar and Niamh. The word féin [me] when following Conas atá tú [How are you]. Is that just a reflex marker? Also, is there gender in Irish?" (Learner A, 2018)*

Interestingly, a significant proportion of learners sought to provide answers directed at the course facilitators throughout the 3 weeks, demonstrating collaborative and peer-learning i.e. 46% of total comments made e.g. this reply was made by a learner to the example above:

> *"[NAME], that's exactly right. When preceded by the definite article (an), feminine nouns take a séimhiú (h), whereas masculine nouns do not. For this reason, when learning nouns, it can be useful to try and learn them with the definite article" (Learner B, 2018)*

Theme 2: Technical Assistance/How to do

Learners sought guidance relating to technical assistance for example how to use the *fada* on various electronic devices such as in the case of a learner, as well as comments around how to

ISBN 978-615-5511-25-7

do things within the course such as where and how to ask questions of Oscar and Niamh as indicated by another learner:

> *"I am struggling to use the accented letters on an Ipad. I see them then I press and hold but don't seem to be able to use them. Any tips?" (Learner C, 2018)*

> *"I'm not sure how to ask Oscar and Niamh questions. Did I miss something?" (Learner D, 2018)*

Most of the comments relating to technical assistance and what to do were made in Week 1. As with course content, many learners sought to respond to each other:

> *"Press, hold, then slide the finger to select the letter you want. May need a bit of practice." (Learner E, 2018)*

Theme 3: Recommendations/Sharing of Resources

There were 90 comments relating to recommendations and the sharing of resources as indicated by one learner:

> *"Dear Oscar and Niamh I am interested in the history of the development of the Irish alphabet and language. Are there any particular books you would recommend on the subject?" (Learner F, 2018)*

Learners provided the majority of recommendations and useful resources as shown in an example from a learner:

> *"I'm sure that Oscar and Niamh will have some great suggestions, but in the meantime let me introduce you to one of my favorite online resources.*
> *www.teanglann.ie has five dictionaries*
> *Irish-English*
> *Irish-Irish*
> *English-Irish*
> *Grammar You can see how verbs are conjugated and also look up the different forms of the nouns and adjectives*
> *Pronunciation In this one you can listen to the pronunciation of a word in the three dialects.*
> *It's also available as a phone app." (Learner G, 2018)*

Theme 4: Course Facilitators and Overall Course

A total of 142 comments were captured relating to course facilitators and the overall Irish101 course which were predominantly positive in nature. These comments included favourable thank you and appreciation comments directed at the weekly Oscar and Niamh videos as indicated by one learner

ISBN 978-615-5511-25-7

> *"Go raibh maith agat a Niamh agus Oscar, [Trans: Thank you Niamh and Oscar] you spoke English in exactly the right speed for me to process and I suspect everyone else too. You succeeded making a great effort to maintain Anglo zombie-speed instead of Irish street-speed, and I truly appreciate that. Obtained a DVD The Most Fertile Man in Ireland recently, absolute slap stick comedy at its cheekiest and a gem, but no subtitles, it was in English I couldn't understand a word most of the time – still it was easy to follow. It is the speed of Irish that worries me most." (Learner H, 2018)*

Favourable comments in relation to course facilitators and the course itself were more notable in Week 3, the final week of the course e.g.:

> *"Go raibh míle maith agaibh Niamh agus Oscar. Bhain me an taitneamh as an cursa. Ta súil agam so bhfeicim sibh i gcursa 102. Slán go foill a chairde [Trans: Thank you very much Niamh and Oscar. I really enjoyed the course. I hope I will see you in the 102 course. Goodbye for now friends]." (Learner I, 2018)*

while another learner highlighted his sentiments about the course:

> *"This course was terrific! I really enjoyed it. Unfortunately unforeseen circumstances made it impossible for me to give it all the time necessary for me to absorb all the information. I will be traveling soon so I won't be able to take much advantage of the extra time (Mar. 4) that you extend for the class. (thank you, that is a fantastic idea!)*
> *Will you be offering this course again?*
> *Will you be offering Irish 2 again also?*
> *I want to master all the information and pronunciation before I go forward. I'm so glad I came across 'Future Learn' and DCU! I did this as an audit course just to see what it was all about and I am extremely impressed by your presentation, structure and delivery.*
> *I look forward to taking many certificate courses in the future. Slán go foill [Trans: Goodbye for now]." (Learner J, 2018)*

Discussion

The findings of this study highlight how the integration of digital technologies by using two animation robots within the course design led to high student engagement levels over the duration of the LMOOC. Learners took an active role in posting comments and communicating with other learners to provide answers to questions posted in the Questions of the Week section. This created a high level of social and cognitive presence within the LMOOC, two of the three required forms of presence required in an online environment for meaningful learning to occur (Garrison, Anderson, & Archer, 2000). The animation robots provided an active teaching and facilitative presence to the LMOOC by (a) uploading weekly videos featuring answers to frequent questions asked by learners and (b) by responding to

ISBN 978-615-5511-25-7

more specific questions within the comments section of the Questions of the Week. The high percentage of videos viewed in their entirety by learners also indicated their interest in learning the answers to the questions posed by themselves and other learners. This compares to studies undertaken by Jung and Lee (2018) who found a positive correlation between teacher presence and learner engagement. Favourable comments posted by learners towards course facilitators especially in the final Week 3 of the LMOOC heightened the importance of teacher presence for learners. There was little evidence of negative responses to Oscar and Niamh within the comments. The study also found and as indicated by Kop and Fournier (2011) that course facilitators need to be willing to take on a multitude of roles, not just a teacher or facilitator but also a technical support provider, a sharer of resources and a supporter of repurposing of information. Finally, the study aligns with findings from research undertaken by Kop and Fournier (2011) which shows that learning and engagement is enhanced through the presence of both facilitators and learners who form a community built on a strong sense of belonging thus leading to stimulated and active participation.

Conclusions and Further Research

Our findings have shown that learners actively engaged and responded to Oscar and Niamh, the two animation robots used within the LMOCC. This was achieved by creating a Questions of the Week section which provided an opportunity for learners not only to post comments but to engage with other learners as well as course facilitators on topics relating to course content, technical support as well as the sharing of useful resources creating a community of active participation. The study also supports to existing research on the importance of social and teacher presence being central in course design to facilitate meaningful learning (Jung & Lee, 2018; Kop & Fournier, 2011). This study was empirical in nature and comprised of a thematic analysis of data generated from course comments and learner behaviour within the LMOOC. Further research to ascertain learners' deeper perceptions will be conducted in subsequent iterations of these courses.

References

1. Conole, G., (2013). MOOCs as disruptive technologies: strategies for enhancing the learner experience and quality of MOOCs. *RED, Revista de Educacion a Distancia, 39.*
2. Dunlap, J. & Lowenthal, P. (2009). Tweeting the Night Away: Using Twitter to Enhance Social Presence. *Journal of Information Systems Education, 20*(2).
3. de Freitas, S. (2017). Are Games Effective Learning Tools? *A Review of Educational Games. Educational Technology & Society, 21*(2), 74-84
4. Garrison, D. R., Anderson, T., & Archer, W. (2000). Critical inquiry in a text-based environment: computer conferencing in higher education. *The Internet and Higher Education, 2*(2–3), 87–105.
5. Hew, K. F. (2016). Promoting engagement in online courses: What strategies can we learn from three highly rated MOOCS: Engagement: lessons from MOOCS. *British Journal of Educational Technology, 47*(2), 320-341.

ISBN 978-615-5511-25-7

6. Jung, Y., & Lee, J. (2018). Learning Engagement and Persistence in Massive Open Online Courses (MOOCS). *Computers and Education, 122*, 9-22.
7. Kop, R., & Fournier, H. (2011). A Pedagogy of Abundance or Pedagogy to Support Human Beings? Participant Support on Massive Open Online Courses. *The International Review of Research in Open and Distance Learning, Research Articles, 12*(7).
8. Vygotsky, L. S. (1978). *Mind in Society: The Development of Higher Psychological Processes.* Cambridge, MA: Harvard University Press
9. Wouters, P., & van Oostendorp, H. (2013). A Meta-analytic review of the role of instructional support in game-based learning. *Computers & Education, 60*(1), 412-425.

ISBN 978-615-5511-25-7

Towards Personalized Guidance and Support for Learning
Proceedings of the 10th European Distance and E-Learning Network Research Workshop, 2018
Barcelona, 24-26 October, 2018
ISBN 978-615-5511-25-7

MOODY MOOCS: AN EXPLORATION OF EMOTION IN AN LMOOC

Elaine Beirne, Conchúr Mac Lochlainn, Mairéad Nic Giolla Mhichíl, Dublin City University, Ireland

Summary

This paper reports on the emotions experienced by participants of a language learning MOOC or LMOOC. It has been previously shown that emotions play a key role in the learning process. Therefore, identifying and understanding the emotions experienced in new learning environments, such as LMOOCs, is of particular importance. This study was conducted during the first iteration of the Irish language and culture MOOC, Irish 101, which is delivered through the FutureLearn platform. An analysis of both self-report data and in-course learner comments is conducted to identify the emotions experienced during various content steps in the LMOOC. We found that positive emotions, such as curiosity, excitement and pride, were reported most strongly by participants throughout the course. However, certain sections of content evoked comparatively stronger instances of negative emotion such as frustration and confusion. Examples of how these emotions manifested in the discussion posts are also presented. This paper concludes by discussing the potential of emotion research for informing LMOOC design.

Introduction

For a long time, emotions were considered to be outside the realm of rational thought and thus systematically ignored in educational research. In the past few decades, however, educational science has been experiencing an affective turn (Pekrun & Linnenbrink-Garcia, 2014). Increasing interest in emotions in education has emerged in the literature following recognition of the inextricable link between cognition and emotion. Subsequent research has proven that emotions have a significant impact on learning achievement (Pekrun, Goetz, Titz, & Perry, 2002). Despite this progress, there remain many learning contexts where the relationship between emotions and learning is less understood.

Massive Open Online Courses (MOOCs) are online instructional platforms that have grown in popularity in the past decade, in particular among higher education institutions. In 2017, over 800 Universities around the world had launched at least one MOOC (Shah, 2018). The high expectation associated with the influx of MOOCs into higher education has provoked a burst of research focused on improving pedagogical and technical approaches in order to maximise their effectiveness. While the majority of this research has been student-focused (Veletsianos & Shepherdson, 2016), the affective dimensions of learning have not received as much attention in MOOC research. The role of emotion in online learning contexts such as

MOOCs is of particular importance considering the regulatory role of instructors in face-to-face environments and the corresponding lack of such support for online learners. The role of a teacher involves understanding and responding to student emotional patterns (Mayer, 2004), providing assistance and reacting to prompts. In comparison, online instruction, even when synchronous, relies on a delayed form of reaction. A far greater reliance is placed on adequate design, appropriate pedagogical foundations and ensuring frequent contact with instructors.

Initial investigations of emotion in a MOOC context have used MOOC discussion forums (Wen, Yang, & Rosé, 2014) and click stream data (Leony, Muñoz-Merino, Ruipérez-Valiente, Pardo, & Kloos, 2015) to infer student emotion. Dillon et al. (2016) however, utilised a self-report approach, giving voice to the student and the subjective nature of emotion. They investigated student emotion during an introduction to statistics MOOC, obtaining self-report data at multiple points during the course. The current paper reflects this approach, addressing key questions about student emotion in a language learning MOOC (LMOOC). Learning a language is not comparable to learning other subjects. This is mainly because of the social nature of such a venture. The process is not only knowledge-based but mainly skill-based, requiring interaction with other speakers and the use of higher order thinking skills, not just memorisation and mechanical reproduction (Bárcena & Martin-Monje, 2015). As a result, facilitating the acquisition of language-specific skills is a significant challenge in an online context, in particular in a MOOC context which consists of potentially thousands of heterogeneous students and templates that promote a transmission-based approach to learning. However, as Sokolik (2014) points out, the infancy of LMOOCs presents us with an opportunity to "get it right", informed by the mistakes of the past. A greater understanding of learner emotions in an LMOOC context could enhance this process.

The Current Study

This study explores the presence of emotion in the Irish language MOOC, Irish 101, provided by Dublin City University in Ireland, through an analysis of self-report data and discussion forum posts.

The following two research questions will be addressed:

- What emotions do learners self-report when engaged in an LMOOC?
- Is there evidence of these emotions in course discussion posts?

Method

Learning Environment

We conducted this study during the first iteration of an Irish language and culture MOOC, Irish 101, which is hosted by the FutureLearn platform. This MOOC is offered by DCU as part of the Fáilte ar Líne (Welcome Online) initiative. This project is co-funded by the Irish Government, specifically the Department of Culture, Heritage, and the Gaeltacht, under the Twenty-Year strategy for the Irish Language, with support from the National Lottery. The

ISBN 978-615-5511-25-7

course was designed for *ab-initio* learners of the Irish language. It began in January 2018 for three weeks, consisting of approximately 4 hours of learning per week. The content each week is broken down into 32 steps on average and these steps are grouped under various themes such as greetings, hobbies, giving directions etc.

Procedure

An experience sampling approach was used to collect self-reported data pertaining to learners' emotions during the course. Following various steps, learners were prompted to self-report on the emotions they experienced while learning during that step. The survey appeared as a link within the step. It was intended that the immediacy of the measurement would reduce the retrospective bias inherent in self-report data. There were 6 data collection points per week (18 in total). All responses were anonymous and participation was optional.

An analysis of discussion forum posts for two exemplar steps was then conducted to identify if, and how, the emotions identified by the survey were expressed by participants during these steps. This qualitative analysis of learner comments was intended to supplement the survey results and provide important contextual information that addressed some of the limitations of the quantitative instrument, in particular, the lack of subjective articulation of emotions. It also opened up an avenue to explore the reasons why learners expressed these emotions. This multiple methods approach was ensured that the research was "…inclusive, pluralistic and complementary" (Johnson & Onwuegbuzie, 2014; p.17). Ethical approval for the study was obtained from DCU's Research Ethics Committee in January 2018 (DCUREC/2017/205).

Emotion Measures

Survey Instrument

The short version of the Epistemic Emotion Scale (EES) developed by Pekrun, Vogl, Muis, and Sinatra (2017) was used to assess students' learning-related emotions due to the fact that it is minimally invasive and thus suitable to an experience sampling approach. This version of the scale contains one item per emotion, measuring a total of 7 emotions: *surprise*, *curiosity*, *enjoyment*, *confusion*, *anxiety*, *frustration* and *boredom*. Adaptations to the scale to account for an Irish language learning context included the addition of a further four emotions: *hope*, *hopelessness*, *pride* and *anger*. These, and the other emotions on the scale, were found to be relevant to Irish language learning during prior research conducted by the study's team. The final scale investigated eleven emotions. Participants responded to each item using a 5-point Likert scale in which they were asked to indicate how strongly they felt the emotion from 1 = *not at all* to 5 = *very strongly*. Contextualised instructions were included to address each task type.

Discussion Posts

At the end of each step in the course, learners had the option to contribute to a discussion forum. One exception to this was during quiz steps. Comments posted in the discussion forum for two exemplar steps investigated by the survey were downloaded and coded as

ISBN 978-615-5511-25-7

positive, negative or neutral. They were then further categorised into subject themes which allowed researchers to identify contrasting and supporting evidence for the survey results.

Findings

Survey Results

Of the 10,464 people who enrolled for the course, 2931 learners completed the survey at least once during the course. The emotion felt most strongly by participants during the course was *Curiosity*, with over 55% of respondents reporting *Strong* or *Very Strong* instances of curiosity. This is followed by *Excitement* (32%), *Hope* (28%) and *Pride* (26%). Figure 1 presents a breakdown of the reported emotion over the 18 data collection points. Notably, emotions varied with regard to different sections of content during the course. Curiosity, while remaining the emotion reported most strongly by participants throughout, experienced a gradual decline over the course. Step 2.15 (cultural article about place names) proved to be an exception to this as curiosity increased significantly during this step. Following a sharp decline at the beginning of the course, other positive emotions such as excitement, pride and hope remained relatively stable throughout the course. Mirroring curiosity, these positive emotions were also experienced strongly by participants during step 2.15. Step 3.10 (Vocabulary for giving directions) also evoked positive emotions among respondents. The strong presence of positive emotion is comparable to the results of the Dillon et al. (2016) study. They found that the positive emotions of Hope and Enjoyment were the most frequently reported among the participants of their statistics MOOC.

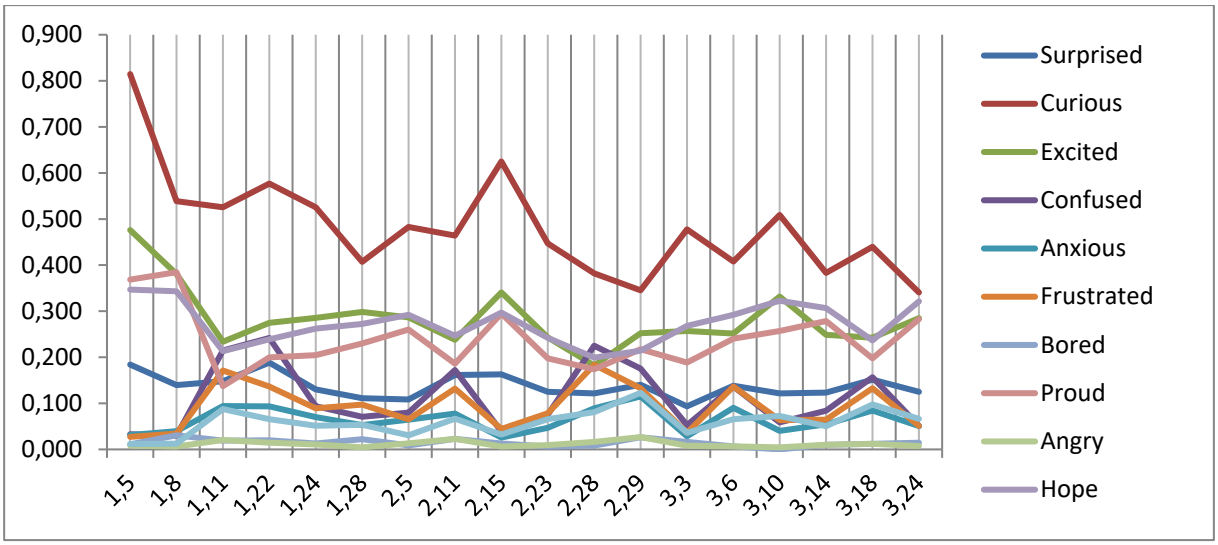


Figure 1. Distribution of emotion over course

While positive emotion dominated throughout, some content evoked comparatively stronger reports of negative emotion. For instance, the percentage of participants identifying strongly with confusion increases 7-fold, from 3% to 21%, during step 1.11 (Conversation Video) compared to step 1.8 (Quiz) of the course. Again during step 2.28 (Grammar Quiz) strong reports of confusion increased significantly when compared to the previous steps investigated. Interestingly, other negative emotions such as anxiety, frustration and hopelessness follow the

ISBN 978-615-5511-25-7

same pattern to varying degrees during these steps. These spikes in negative emotion also correspond with drops in the reports of strong positive emotions during the same steps.

These survey results highlight that learners experience certain emotions more strongly during different sections of content in an LMOOC. In order to explore these results further, two steps were selected for specific comment analysis due to their distinctiveness among the survey results. Step 1.11 was chosen for its comparatively high negative emotional reaction, particularly following mainly strong positive emotion reports prior to that step. Step 2.15 was selected for its particularly strong positive emotional trend. For a description of these steps see Table 1.

Table 1: Description of steps

Step Number	Week	Task Type	Description
1.11	1	Video	Introduces participants to a basic conversation in Irish. Two people introduced themselves to each other in Irish.
2.15	2	Article	Cultural piece, explaining the links between the Irish language and place names in Ireland.

Discussion Post Interpretation

1.11 Conversation Video

The survey results indicated that this step provoked comparatively strong reports of negative emotion. Despite this, curiosity and excitement were still the emotions reported mostly strongly by respondents. The analysis of learner comments during this step, however, identified predominantly negative posts from learners. Many expressed concern that the video content was too difficult, referring to pronunciation and the speed of the conversation. Reference was also made to non-linguistic aspects of the video such as the long introduction and background music. Interestingly, this was one of the first interactions learners had with a linguistic task which in this case was listening. Previous steps consisted of introductory blocks of grammar and culture.

> *"Found this video a little too fast, also would like know what they are saying." (Learner A)*

> *"A lot of intro and music to a very fast conversation. Not very helpful to a novice." (Learner B)*

> *"Perhaps the jump from single words to quickly spoken sentences is a little sudden? Slowing down the interaction just made them sound very strange." (Learner C)*

The comments also indicated that some learners returned to the step having completed successive steps in which the linguistic elements of the video were explained in more detail. This highlights the importance of how activities are structured for learner understanding.

> *"Just realizing all these phrases are explained in future lessons…" (Learner D)*

ISBN 978-615-5511-25-7

Finally, it is also important to note the role of learner interaction during the course, with many participants encouraging each other, suggesting that learners potentially play a role in regulating emotions.

> *"Good job! I can't do that yet" (Learner E)*

2.15 Cultural Article

In contrast to the difficulties found in step 1.11, step 2.15, in which learners explored Irish language place names, showed strong increases in positive emotions, such as curiosity, excitement and pride. Learner comments pointed to several possible reasons for this, such as intrinsic enjoyment of the task:

> *"The Irish place names are quite fascinating as they have history and location built into them" (Learner F)*

Contextual application of the knowledge in the step to existing learner knowledge (the step prompted learners to talk about their own home-places and their lexicological origins):

> *"A very interesting section. Caloundra where I live in Australia is on the coast. The word Caloundra is an Aboriginal word meaning 'place of the beech tree' or 'Callanda' a beautiful place, which it is." (Learner G)*

A general enjoyment of the discussion relating to place names:

> *"A fascinating section. Love all the comments" (Learner H)*

A mixture of both pride and aesthetic appreciation of the language:

> *"It strikes me how lyrical and visual the original place names are" (Learner I)*

This strongly positive reaction speaks to the potential usage of cultural teaching embedded within grammatical tasks as a way of provoking strongly positive responses and engagement from learners.

Conclusion

Identifying the emotions experienced within LMOOC environments is an important task. Our results show that learners experience a variety of both positive and negative emotions while learning with different types of content in an LMOOC. We also found that broadly positive and broadly negative emotions appear to move in tandem. At a macro-level, the results show that Curiosity is the emotion participants felt most strongly; however, it is within the variation of the less commonly reported emotions that the, arguably, more valuable findings emerge.

There are a few limitations in this study. Firstly, we acknowledge that our results may be biased by the high rate of attrition in the MOOC. This was reflected in survey responses and course activity. Secondly, due to the anonymity of the surveys it was not possible to determine

ISBN 978-615-5511-25-7

whether the survey sample reflected the participants who contributed to the discussion forums in the course, although some overlap is likely.

Our analysis points to several implications for LMOOC and also MOOC design more generally. Significant diversity was found in learner emotions, pointing to the need for designers and instructors to understand these distinctions and their potential role in learning at a distance. Furthermore, the analysis of discussion forum posts proved useful in identifying the reasons why learners experienced certain emotions. This highlights some of the benefits of qualitative research in a field that to date has been dominated by quantitative studies. Further research with regard to emotion antecedents would be beneficial in informing teaching strategies and interventions that encourage positive emotions during learning in a MOOC environment.

References

1. Bárcena, E., & Martin-Monje, E. (2015). Introduction: Language MOOCs: An emerging field. In *Language MOOCs: Providing Learning, Transcending Boundaries* (pp. 1–15). https://doi.org/10.2478/9783110422504.1
2. Dillon, J., Bosch, N., Chetlur, M., Wanigasekara, N., Ambrose, G. A., Sengupta, B., & D'Mello, S. K. (2016). Student Emotion, Co-occurrence, and Dropout in a MOOC Context. *Proceedings of the 9th International Conference on Educational Data Mining.* Raleigh, North Carolina, USA: International Educational Data Mining Society (IEDMS).
3. Johnson, R. B., & Onwuegbuzie, A. (2004). Mixed-methods research: A research paradigm whose time has come. *Educational Researcher, 33*(7), 14-26.
4. Leony, D., Muñoz-Merino, P. J., Ruipérez-Valiente, J. A., Pardo, A., & Kloos, C. D. (2015). Detection and Evaluation of Emotions in Massive Open Online Courses. *Journal of Universal Computer Science, 21*(5), 638–655.
5. Mayer, J. D. (2004). What is Emotional Intelligence? *UNH Personality Lab, 8.*
6. Pekrun, R., Goetz, T., Titz, W., & Perry, R. P. (2002). Academic Emotions in Students' Self-Regulated Learning and Achievement: A Program of Qualitative and Quantitative Research. *Educational Psychologist, 37*(2), 91–105. https://doi.org/10.1207/S15326985EP3702_4
7. Pekrun, R., & Linnenbrink-Garcia, L. (2014). *International Handbook of Emotions in Education.* Routledge.
8. Pekrun, R., Vogl, E., Muis, K. R., & Sinatra, G. M. (2017). Measuring emotions during epistemic activities: The Epistemically-Related Emotion Scales. *Cognition and Emotion, 31*(6), 1268–1276. https://doi.org/10.1080/02699931.2016.1204989
9. Shah, D. (2018, January 18). By the numbers: MOOCs in 2017 [Blog post]. Retrieved from https://www.class-central.com/report/mooc-stats-2017/

ISBN 978-615-5511-25-7

10. Veletsianos, G., & Shepherdson, P. (2016). A Systematic Analysis and Synthesis of the Empirical MOOC Literature Published in 2013–2015. *The International Review of Research in Open and Distributed Learning, 17*(2). Retrieved from http://www.irrodl.org/index.php/irrodl/article/view/2448

11. Wen, M., Yang, D., & Rosé, C. (2014). Sentiment Analysis in MOOC Discussion Forums: What does it tell us? *Proceedings of the 7th International Conference on Educational Data Mining.* London, United Kingdom: International Educational Data Mining Society.

ISBN 978-615-5511-25-7

Towards Personalized Guidance and Support for Learning
Proceedings of the 10th European Distance and E-Learning Network Research Workshop, 2018
Barcelona, 24-26 October, 2018
ISBN 978-615-5511-25-7

CAN YOU GIVE ME SANCTUARY? EXPLORING THE TRANSITION EXPERIENCES OF REFUGEES AND ASYLUM SEEKERS TO ONLINE DISTANCE LEARNING

Orna Farrell, Mark Brown, James Brunton, Eamon Costello, L. Delaney, C. Foley, Dublin City University, Ireland

Summary

Dublin City University (DCU) was granted the status of "University of Sanctuary" in December 2016. Fifteen scholarships were granted to refugees and asylum seekers; one provided by each of the five DCU faculties and the remaining ten provided by DCU's online education platform, DCU Connected. This paper will report on the journey undertaken by a team within DCU's National Institute for Digital Learning as they put in place the framework needed to support these scholars and the related research study which explores the nature of the transition experiences of University of Sanctuary Scholars to online distance learning. A longitudinal qualitative study is designed to seek a greater understanding of these learners' experiences in the early stages of the study lifecycle, and of how their transition into higher education can be facilitated to enhance student success. The data collection technique is semi-structured online interviews conducted annually, and the first round of interviews has recently been conducted. The data-led analytical approach for this study is Braun and Clarke's (2006) six phases of thematic analysis. The next phase of the research project involves the analysis of the first phase of interview data and the generation of preliminary findings.

Figure 1. Universities of Sanctuary Logo

Introduction

This paper reports on the journey undertaken by a team within DCU's National Institute for Digital Learning as they put in place the framework needed to create the University of Sanctuary scholarships and the related research activity exploring the nature of the transition experiences of University of Sanctuary Scholars to online distance learning.

Figure 2. Universities of Sanctuary Launch DCU 2016

In order to support and retain the University of Sanctuary Scholars as DCU Connected students it is necessary to gain a greater understanding of these learners' experiences in the early stages of their higher education journey, in order to facilitate and enhance their success as online distance students. The purpose of this study is to explore the nature of the transition experiences of university of sanctuary scholars to online distance learning. This research project aims to generate new knowledge about the transition experiences of University of Sanctuary scholars to online distance learning and to then harness this new knowledge to effectively support this cohort of students.

Contexts from the Literature

Online distance learning can enable access to higher education for underrepresented groups such as asylum seekers and refugees (Castaño-Muñoz, Colucci, & Smidt, 2018). These groups face structural, financial and digital skills barriers to accessing higher education (Crea & Sparnon, 2017; Traxler, 2018) and hence "learning is seen as critical for migrant inclusion" (Castaño-Muñoz et al., 2018; p.2). In order to support the integration and inclusion of migrants in society, access to higher education is crucial (European Commission, 2016).

A number of high-level reports have emphasised the importance of opening up access to higher education for more adult learners through more flexible study options (European Commission, 2014; HEA, 2015; Hunt, 2011; OECD, 2015). These efforts are hampered by the fact that online distance learners are a potentially vulnerable student population with lower completion rates than traditional students (Levy, 2007; Tello, 2007; Stone, 2017; Woodley & Simpson, 2014). Attrition of learners in online and distance learning (ODL) in the United Kingdom (UK) may be as high as 80% (Gallie, 2005). Woodley and Simpson (2014) put the international graduation figure for ODL students as often "around 10% or less".

Given that many students who withdraw from higher education do not return, this fact emphasises the importance of targeted supports in the early stages of the study lifecycle to enhance student success and retention (Stone, 2012).

As outlined above, online distance learning students are more vulnerable to attrition, similarly students from refugee or asylum seeking backgrounds face significant challenges with regard

ISBN 978-615-5511-25-7

to socio-cultural, technology, family, and health issues when transitioning to university (Streitwieser, Brueck, Moody, & Taylor, 2017; Baker, Ramsay, Irwin, & Miles, 2018; Kong, Harmsworth, Rajaeian, Parkes, Bishop, AlMansouri, & Lawrence, 2016). According to research carried out by Baker et al. (2018) students from refugee backgrounds face challenges availing of the formal university supports or *cold supports* such as lecturers, learning and support services and favoured drawing on *warm supports* such as family and friends to help with coursework. In addition, a study carried out by Salvo and de C Williams (2017) highlighted the positive impact of providing adequate supports for the psychological well-being of refugee and asylum seeker students on their learning as well as empowering their learning agency through involvement in the planning and delivery of the course.

In summary, the literature presented above highlights that it is important that the needs of the University of Sanctuary scholars who are both asylum seekers/refugees and online distance students are understood and supported to facilitate their success at higher education.

Methodology

A longitudinal, qualitative study was designed to seek a greater understanding of University of Sanctuary scholars' experiences in the early stages of the study lifecycle. The rationale for this methodological approach was that we were concerned about introducing an unequal power relationship which was more likely with a method that captured this data in real time as they experience their study week by week.

Following from a review of the literature we formulated the following overarching research question:

> *"What are University of Sanctuary scholars' experiences of starting to study in the online distance learning context?"*

The setting for this research is DCU Connected at Dublin City University (DCU) Ireland. DCU Connected delivers flexible, part-time undergraduate and postgraduate programmes through the mode of online distance learning.

Ethical approval for the study was granted by the DCU Research Ethics Committee. Participants who are asylum seekers may be more psychologically vulnerable than other students due to the fact that they live in direct provision, which is a controlled, sometimes stressful environment where they have limited control over aspects of their daily lives. Although not the specific focus of the research study where aspects of their experience of direct provision, or their personal journey to becoming asylum seekers come up during discussion of their transition to studying at higher education level, there is a possibility of participants experiencing a level of distress.

Risk management procedures for this study include: designing an interview schedule that focuses on their educational experiences rather than experiences of seeking asylum etc.; utilising appropriate interview technique whereby if a participant begins to show distress the

ISBN 978-615-5511-25-7

interviewer will offer to pause the process, and/or move to another part of the interview schedule, and/or halt the interview; following up with any participant who shows distress to facilitate connection with DCU Counselling Services or the DCU Chaplaincy as appropriate. The DCU Chaplaincy has maintained a pastoral support role in the University of Sanctuary Scholarship process. In the plain language statement and informed consent form participants are encouraged to contact the DCU Counselling service if, following participation in the study, they later experience distress.

Participants were selected based on convenience sampling and are asylum seekers and/or refugees based in Ireland, who have been awarded a scholarship to study with DCU Connected. Participants are registered as part time students on DCU Connected programmes. The first cohort of participants recruited is comprised of seven students of which five are male and two are female. Participants are geographically distributed around Ireland and are primarily living in government direct provision centres. Additional participant cohorts will be recruited annually.

The data collection technique is semi-structured recorded interviews conducted online annually by the research team, once per year for three years. Interviews are conducted in real time online using a private Adobe Connect classroom. An interview schedule was created which contained sixteen open-ended questions which were shaped by the research questions. The interview schedule contained questions about starting to study, community and social integration, supports and services, experiences of studying online, expectation and goals.

The first phase of interviews is being transcribed and prepared for analysis at the time of writing this paper. Then, the data will be analysed following the Braun and Clarke (2006) six phases of thematic analysis analytical approach. The rationale for this approach is that thematic analysis is a flexible and rich method for reporting patterns in qualitative data (Braun & Clarke, 2013). Following a circular model of collection and analysis of data, the preliminary findings will shape the second phase of data collection (Miles & Huberman, 1994).

Being insider researchers can cause ethical dilemmas and concerns around the objectivity, validity and reliability of a research study. Research from the inside can be both scholarly and rigorous provided the researcher is aware of their potential influence and awareness of potential bias (Sikes & Potts, 2008). This issue was dealt with by maintaining a distance from the participant cohort, the research team conducted interviews with participants that they did not directly teach and institutional and programme level gatekeepers to access and interaction with the cohort were used, so as not to exert undue influence.

Next Steps

The next phase of the research project involves the analysis of the first phase of interview data and then the drawing of the preliminary findings of the first cohort of interviews. Following an iterative model of collection and analysis of data, the preliminary findings will shape the

ISBN 978-615-5511-25-7

second phase of data collection (Miles & Huberman, 1994). This new knowledge will then be harnessed to effectively support further groups of University of Sanctuary scholars during their transition to higher education.

Building on the success of the University of Sanctuary scholarships with DCU Connected, DCU, in conjunction with FutureLearn, will offer 30 Scholarships refugees and asylum seekers living in Ireland to undertake online study on the FutureLearn platform.

References

1. Baker, S., Ramsay, G., Irwin, E., & Miles, L. (2018). 'hot', 'cold' and 'warm' supports: Towards theorising where refugee students go for assistance at university. *Teaching in Higher Education, 23*(1), 1. doi:10.1080/13562517.2017.1332028
2. Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology, 3*(2), 77-101.
3. Braun, V., Clarke, V. (2013). *Successful Qualitative Research: A Practical Guide for Beginners.* London: Sage.
4. Castaño-Muñoz, J., Colucci, E., & Smidt, H. (2018). Free Digital Learning for Inclusion of Migrants and Refugees in Europe: A Qualitative Analysis of Three Types of Learning Purposes. *International Review of Research in Open and Distance Learning, 19*(2). doi: 10.19173/irrodl.v19i2.3382
5. Crea, T. M., & Sparnon, N., (2017). Democratizing education at the margins: faculty and practitioner perspectives on delivering online tertiary education for refugees. *International Journal of Educational Technology in Higher Education, 14*(1), 43.
6. European Commission (2014). *Report to the European Commission on New models of learning and teaching in Higher Education.* Luxembourg: Publications Office of the European Union. Retrieved from http://ec.europa.eu/education/library/reports/modernisation-universities_en.pdf
7. European Commission (2016). *Analytical underpinning for a New Skills Agenda for Europe* (SWD(2016) 195 final). Retrieved from http://eurlex.europa.eu/resource.html?uri=cellar:cd0fa1ca-2ee9-11e6-b497-01aa75ed71a1.0001.02/DOC_1&format=PDF
8. Gallie, K. (2005). Student attrition before and after modifications in distance course delivery. *Studies in Learning, Evaluation, Innovation and Development, 2*(3), 69-76.
9. Higher Education Authority (2015). *National Plan for Equity of Access to Higher Education 2015-2019.* Retrieved from http://www.hea.ie/sites/default/files/national_plan_for_equity_of_access_to_higher_education_2015-2019_single_page_version_0.pdf
10. Hunt, C. (2011). *National Strategy for Higher Education to 2030: Report of the Strategy Group.* Department of Education and Skills, Government Publications Office. Retrieved

ISBN 978-615-5511-25-7

from
http://www.hea.ie/sites/default/files/national_strategy_for_higher_education_2030.pdf

11. Kong, E., Harmsworth, S., Rajaeian, M. M., Parkes, G., Bishop, S., AlMansouri, B., & Lawrence, J. (2016). University transition challenges for first year domestic CALD students from refugee backgrounds: A case study from an Australian regional university. *Australian Journal of Adult Learning, 56*(2), 170.
12. Levy, Y. (2007). Comparing Dropouts and Persistence in E-Learning Courses. *Computers & Education, 48*(2), 185–204.
13. Miles, M. B., & Huberman, A. M. (1994). *Qualitative Data Analysis: An expanded sourcebook* (2nd ed.). Thousand Oaks: Sage.
14. OECD (2015). *Education at a Glance: OECD Indicators.* Retrieved from https://read.oecd-ilibrary.org/education/education-at-a-glance-2015_eag-2015-en#page1
15. Salvo, T., & de C Williams, A. C., 2017. "If I speak English, what am I? I am full man, me": Emotional impact and barriers for refugees and asylum seekers learning English. *Transcultural psychiatry, 54*(5-6), 733–755.
16. Sawhney, N., (2009) Voices beyond walls: the role of digital storytelling for empowering marginalized youth in refugee camps. *Proceedings of the 8th International Conference on Interaction Design and Children*, 302–305.
17. Sikes, P., & Potts, A. (2008). *Researching education from the inside.* London: Routledge.
18. Stone, C. (2012). Engaging Students Across Distance and Place. *Journal of the Australian and New Zealand Student Services Association, 39*, 49-55.
19. Stone, C. (2017). *Opportunity through online learning: Improving student access, participation and success in higher education.* Equity fellowship final report. National Centre for Student Equity in Higher Education.
20. Streitwieser, B., Brueck, L., Moody, R., & Taylor, M. (2017). The potential and reality of new refugees entering German higher education: The case of berlin institutions. *European Education, 49*(4), 231. doi:10.1080/10564934.2017.1344864
21. Tello, S. F. (2007). An Analysis of Student Persistence in Online Education. *International Journal of Information and Communication Technology Education, 3*(3), 47–62.
22. Woodley, A., & Simpson O. (2014). Student dropout: The elephant in the room. *Online distance education: Towards a research agenda*, 459-484.

ISBN 978-615-5511-25-7

Towards Personalized Guidance and Support for Learning
Proceedings of the 10th European Distance and E-Learning Network Research Workshop, 2018
Barcelona, 24-26 October, 2018
ISBN 978-615-5511-25-7

SUPPORT HOLES: DISTANCE STUDENTS EXPERIENCE OF SUPPORT IN A DUAL MODE UNIVERSITY

Lorraine Delaney, Mark Brown, Dublin City University, Ireland

Summary

This paper focuses on the overall supports and obstacles distance graduates experienced as they progressed through their studies in a dual-mode university. The mixed-methods case study drew on findings from an online survey (n = 126) and 17 semi-structures interviews to explore how recent distance graduates (n = 268) experienced support. Findings indicate that while support from teaching staff was noted as important to their successful completion, a lacuna in institutional supports was identified. First, systems and structures within the dual-mode university were perceived as being designed for on-campus students, with little regard to the needs of distance students. Second, students perceived their employment was unvalued by the university. There seemed little support when employment related issues impacted study, yet work-placement for on-campus students was a source of academic credit. Third, students felt excluded from the guidance and support available to on-campus students. Critically, they did not avail of the career service which can impact transitioning into graduate level employment. This paper argues that guidance and support for learning is multi-faceted and extends beyond teaching. Creating enabling conditions that encourage learner agency and self-direction is a job for the university as a whole. Policy makers too have an important role to play in this regard.

Introduction

The European Commission (2014; p.11) assert that "flexibility is essential for non-traditional learners", with older students more likely to study part-time (European Commission, 2015). In order to achieve national and international targets for broadening access to non-traditional learners it would seem imperative, in order to meet the demand for part-time study, that dual mode university provision is developed and supported. However, the development of dual mode provision is hindered by our lack of knowledge about the experience of those who successfully complete courses in this manner.

Set against the backdrop of this problem, the research question for this paper is, how have distance graduates experienced support in a dual mode university? To answer the question, the paper explores the obstacles successful students face, both inside and outside their courses, and the extent to which the university is perceived by them to support their persistence. This information is vital for institutions who wish to expand dual-mode provision and widen participation.

Literature review

A large volume of literature is available on those who have withdrawn from distance education (Simpson, 2002; Stone, 2017; Subotzky & Prinsloo, 2011; Woodley, 2004). Less is known about the participation experience of those who successfully complete (Butcher, 2015; Woodfield, 2011). Within the distance education literature research on graduates relates primarily to programme evaluation. Graduates are, by definition, successful students so it is hardly surprising that graduate evaluation of courses is, in general, favourable (Richardson, 2009). Where negatives exist they relate to expectations around a lighter workload with participation requiring a greater degree of self-direction and self-management than anticipated (Draper et al., 2014; Wilde & Epperson 2006). Distance graduates often feel disconnected from teachers and other students and think the number of courses offered through distance learning is limited (Pate & Miller, 2012).

When we examine the literature in relation to the participation experience of campus based, non-traditional students we see that it is primarily grounded in sociology theory, in particular Social Reproduction Theory. Social Reproduction Theory (Bourdieu, 1973; 1977), contends that societies structures, for example higher education (HE), tend to reproduce privilege and disadvantage in a way that appears legitimate. Non-traditional (e.g. working class) students are more likely to delay their participation in HE (Croxford & Raffe, 2014).

While some studies found that social class had a strong impact on the likelihood of students completing their degrees and on the classification of the award obtained (Furlong & Cartmel, 2005; Powdthavee & Vignoles 2009), others found this not to be the case (Carroll, 2011). Indeed, working class students often focus on academic attainment to the exclusion of extra-curricular activities (Carroll, 2011), a practice which can alienate them from other students and impact negatively on their integration (Greenbank & Hepworth, 2008; Redmond, 2006).

Financial constraints impact the participation experience of non-traditional students, with many having part-time jobs and working long hours (Byrom & Lightfoot 2013). This can disrupt or impede their progression. Although optional work placements have become common for campus-based students as part of their course work, many studies identify patterns of inequality in students' experience of work placements (Allen et al., 2012). Often only the top performing students are selected. Additionally, the hidden costs of work placements (travel, clothing) can make them unattractive to working class students (Greenbank & Hepworth, 2008).

Extra-curricular activities, in particular career planning, help students develop competencies and get ahead in the competition for jobs. Many studies identify how working class students do not engage with extra-curricular activities. They are sufficiently out of their comfort zone by simply studying at university (Bathmaker et al., 2013; Greenbank & Hepworth, 2008, Stevenson & Clegg, 2010).

ISBN 978-615-5511-25-7

In sum, non-traditional students face significant risks when they participate in full-time HE. They are therefore more likely to seek part-time/distance learning opportunities. A cohort of such students is the focus of this study.

Methodology

The sample

This mixed methods research was implemented over a four-year period; 2012-2015 on two undergraduate programmes in the Open Education Unit (formally Oscail) at Dublin City University (DCU). Participants are those who graduated with an honours primary degree (n = 268). Findings were drawn from a web-based survey (n = 126) and face-to-face, semi-structured interviews with 17 graduates. Ethical approval was obtained from DCU's Research Ethics Committee.

Data collection

Survey data was collected from 2013-2015. Graduates were asked in the survey about the factors that supported their successful completion and also about the obstacles they faced during their studies. The face-to-face semi-structured interviews took place between April 2015 and January 2016. The interview was an opportunity to explore in more detail the participation experience of the graduates. While every effort was made to replicate as closely as possible, the overall graduate population when selecting candidates for interview, some anomalies did arise. For example, graduates who attained a first-class honours degree, and those who lived in Dublin, proved more willing to be interviewed.

While quantitative data was analysed descriptively using SPSS, qualitative data was analysed thematically (Brawn & Clarke 2006). When reporting qualitative data, in order to preserve the anonymity of participants their age is categorized as follows: 18-39 = Young (Y), 40-59= Middle aged (M), and 60+ = Old (O). Interview data is identifiable by the use of pseudonyms.

Limitations

The results suffer from the typical limitations of a case study in that they are bound to one particular institution. Additionally, the data is self-reported by the graduates. Furthermore, the approach is interpretative and is characterised by this feature. Nevertheless, some interesting findings emerge.

Findings

Support Factors

Families were by far the most important supporters of the graduates during their studies (see Figure 1). Given that disposable income and family time is eaten into by course participation, it is reasonable that many would find it difficult to complete without family support. Support from the university staff was also of key importance to graduates. Most often this was related to the support of the tutor. Having a support network of other students was important to a majority of respondents. One graduate pointed out that because you have so little time to

ISBN 978-615-5511-25-7

socialise outside the course, socialisation within the course takes on an added significance. Graduates were also keen to point out that their own individual resilience was important in their persistence:

> *"If I start something I finish it – even if I got the Ebola virus, I would have completed the degree" (BA Male M)*

Employer support was not deemed important to most graduates with only 29% ranking it as important. These graduates were more likely to see employer support as important to their successful completion.

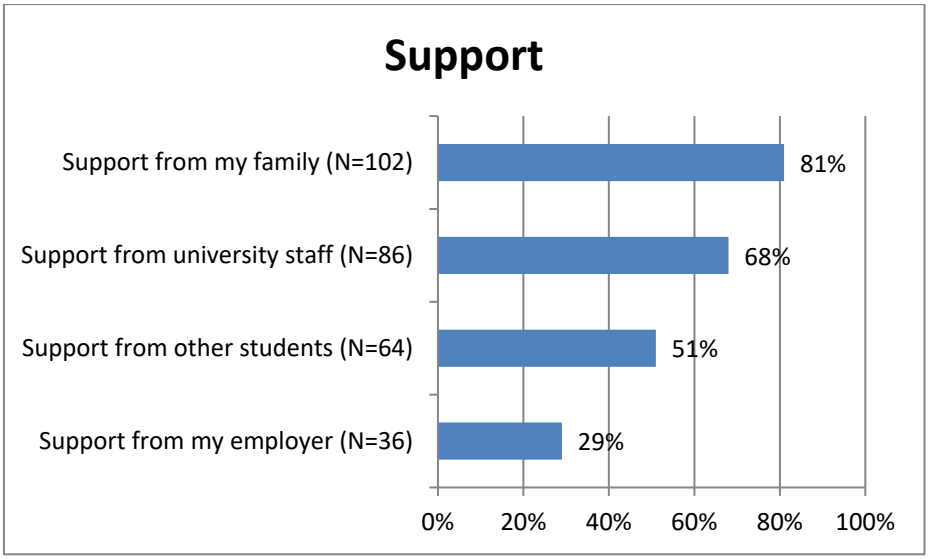


Figure 1. Percentage of graduates who reported that the indicated sources of support were either very important or important in helping them to successfully complete the degree

Obstacles to successful completion

Time

The most important factors, mentioned consistently by respondents, related either directly or indirectly, to conflicting demands on their time (see Figure 2). Work and family commitments were the main reasons for the time pressure, closely followed by the time demands of the course. The time demands of the course were more relevant to those in full-time employment (46%) than those involved in home duties (31%) or employed part-time (29%). The majority of graduates were at an age when work and family demands are at their peak (37% n = 100 were aged 30-39; 35%, n = 93 were aged 40-49). Government policy which supports earlier participation in part-time/distance learning may in turn better support the persistence of this cohort.

Within the qualitative comments submitted in the survey, and during the interviews, more nuanced themes emerged indicating that while *time* was the problem, the support offered by the institution fell short.

ISBN 978-615-5511-25-7

Systems and Structures

Within HE there are rules and regulations which students must assimilate in order to succeed. DCU is primarily a campus-based university, set up and state funded to support full-time, on campus students. Historically the distance student population has been no more than 10% of the total student body. In the main the student body consists of well-resourced school leavers. Distance students sometimes experienced a sense of being less important than full-time students:

> *"It was as if… we weren't given as much consideration as full-time students." (Female Y)*

Interviewees too were unanimous in never having felt part of the university:

> *"I didn't feel I was a student of DCU. I wasn't quite sure what I was" (Ali M)*

> *"…when you're coming in here (DCU) on a Saturday and there isn't a coffee shop open and the place seems dead…you know…it's hard to feel part of an actual living university" (Mary M).*

Graduates perceive they are unimportant when they miss out on information because they are off-campus and removed from regular contact with other students and institutional supports:

> *"Not being on campus & having access to staff advisers meant that I did not realise (important information) until it was too late" (Emer Y).*

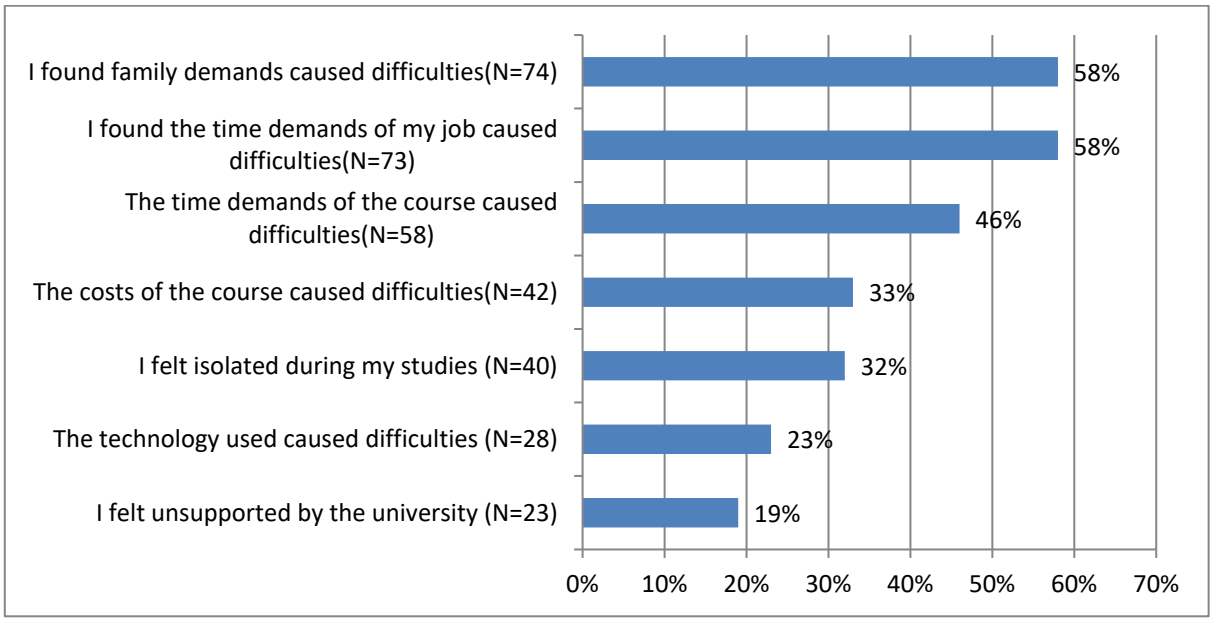


Figure 2. Percentage of graduates who reported that the indicated obstacles were very relevant or relevant to them during the course of their studies.

10th EDEN Research Workshop Proceedings, 2018, Barcelona
ISBN 978-615-5511-25-7

Work and work-placement

Many of the regulations of the university are devised to deal with the predominantly full-time student population and are based on an assumption that students' priority is study. In truth, distance learners must prioritise their work and family commitments. While flexibility is highly valued by distance graduates, institutional norms and practices designed around full-time on campus delivery, can present an obstacle to that flexibility:

> *"I had work related issues and and fell behind and just couldn't catch up. I didn't get credit for the work that I had already done. I found little support from DCU when I had this problem." (male M)*

A discourse currently exists around the similarity between full-time and part-time students since most full-time students also have a job. However, there are critical differences. Part-time students often have serious financial commitments such as a mortgage. For full-time students, study is generally accepted as their primary concern. Although they often also have part-time jobs, they are more regularly in a position to give up jobs to attend to study commitments at critical times of the academic year. They can do this because they are normally supported financially by others (ILCU, 2016). Distance students, on the other hand, are more regularly providers of financial support rather than takers. Sixty-one percent of survey respondents had others who were financially dependent on them. Importantly, distance students do not gain any academic credits for course related employment, something which many full time students benefit from. These differences must frame any discussion on the blurring of lines between part-time and full-time study.

Guidance and support

The distance graduates often felt excluded from institutional supports, observing that such supports seemed to be focused on full-time students. The external face of the university; for example, the website, is overtly focused on full-time students. In effect this means that part-time students have limited awareness of available supports. This is evidenced by the fact that just 6% (n = 8) of survey respondents made contact with the careers service:

> *"Did not know about this service but doubt they have service for part-time students" (Male Y)*

Lack of connectedness with the careers service can disadvantage distance students. The careers service can link graduates with influential individuals, those who may positively influence the graduate's outcomes and future; what Feinstein et al. (2008) refer to as vertical social capital. Some graduates identified how they had been given employment related opportunities during course participation, which they did not recognize or leverage. As many of the graduates were in employment when they commenced studying, they are not always on the look-out for career related opportunities. However, their retrospective accounts indicate they would have benefited from engaging with the careers service to enhance their career development:

ISBN 978-615-5511-25-7

> *"I definitely needed career guidance to see where all this study will bring me. I am feeling my way in the dark most of the time." (Female O)*

Conclusion

The evidence from this study suggests that distance students often feel less important to the institution than full-time students. This finding is perhaps understandable, though not defendable, as in Ireland, HE institutions are funded primarily to support full-time, on campus students. Full-time students therefore remain a more lucrative option for institutions.

Distance students in this study often felt excluded from support services. This can be potentially serious for distance students as they struggle to come to terms with institutional systems and structures which may impact on their award. In particular graduates did not avail of the Careers Service yet within a mass higher education system competition for graduate level jobs is intense and graduates need to be able to move efficiently to avail of opportunities.

In the final analysis resource constraints are a consideration in any solution. Policy makers and institutions have an important role to play in better supporting and valuing part-time distance students if they are serious about achieving widening participation targets.

References

1. Allen, K., Quinn, J., Hollingworth, S., & Rose, A. (2012). Becoming Employable Students and 'Ideal' Creative Workers: Exclusion and Inequality in Higher Education Work Placements. *British Journal of Sociology of Education, 34*(3), 431-452.
2. Bathmaker, A., Ingram, N., & Waller, R. (2013). Higher education, social class and the mobilisation of capitals: recognising and playing the game. *British Journal of sociology of Education, 34*(5/6), 723-743.
3. Bourdieu, P. (1973). Cultural Reproduction and Social Reproduction. In Brown, R. (Ed.) *Knowledge, Education and Cultural Change.* London: Tavistock.
4. Bourdieu, P. (1977). *Outline of a theory of practice.* Cambridge: Cambridge University Press.
5. Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology, 3*, 77-101.
6. Butcher, J. (2015). *'Shoe-horned and side-lined'? Challenges for part-time learners in the new HE landscape: Executive Summary.* The Higher Education Academy, York. Retrieved November 20, 2015, from https://www.heacademy.ac.uk/sites/default/files/resources/PTN%20Executive%20summary.pdf
7. Byrom, T., & Lightfoot, N. (2013). Interrupted trajectories: the impact of academic failure on the social mobility of working-class students. *British Journal of Sociology of Education, 34*(5/6), 812-828.

ISBN 978-615-5511-25-7

8. Carroll, C. (2011). Accessing the graduate labour market: assessing the employability of Irish non-traditional graduates of Trinity College, Dublin. *Widening Participation and Lifelong Learning, 13*(2), 86-104.
9. Croxford, L., & Raffe, D. (2014). Social class, ethnicity and access to higher education in the four countries of the UK: 1996-2010. *International Journal of Lifelong Education, 33*(1), 77-95.
10. Draper, J., Beretta, R., Kenward, L., McDonagh, L., Messenger, J., & Rounce, J. (2014). 'Ready to hit the ground running': Alumni and employer accounts of a unique part-time distance learning pre-registration nurse education programme. *Nurse Education Today, 34*(10), 1305-1310. doi: 10.1016/j.nedt.2014.06.007
11. European Commission (2014). *Report to the European Commission on New models of learning and teaching in Higher Education.* Luxembourg: Publications Office of the European Union. Retrieved from http://ec.europa.eu/education/library/reports/modernisation-universities_en.pdf
12. European Commission/EACEA/Eurydice (2015). *The European Higher Education Area in 2015: Bologna Process Implementation Report.* Luxembourg: Publications Office of the European Union. Retrieved from http://eacea.ec.europa.eu/education/eurydice/documents/thematic_reports/182EN.pdf
13. Feinstein, L., Budge, D., Vorhaus, J., & Duckworth, K. (2008). *The social and personal benefits of learning: a summary of key research findings.* London: Centre for Research on the Wider Benefits of Learning (WBL).
14. Field, J., & Morgan-Klein, N. (2013). Reappraising the importance of class in higher education entry and persistence. *Studies in the Education of Adults, 45*(2), 162-176.
15. Furlong, A., & Cartmel, F. (2005, October 27). Early labour-market experiences of graduates from disadvantaged families. Joseph Rowntree Foundation [Blog post]. Retrieved October 24, 2018, from https://www.jrf.org.uk/report/early-labour-market-experiences-graduates-disadvantaged-families
16. Greenbank, P., & Hepworth, S. (2008). *Working class students and the career decision-making process: A qualitative stud.* A PROP report for HECSU. Retrieved from http://www.hecsu.ac.uk/assets/assets/documents/Working_class.pdf
17. ILCU (Irish League of Credit Unions) (2016). *Cost of 3rd level education. Report.* Retrieved August 19, 2016, from http://www.creditunion.ie/communications/pressreleases/2016/title,10274,en.php
18. Pate, M. L., & Miller, G. (2012). The Off-Campus Bachelor of Science in Professional Agriculture Degree Program: A Final Alumni Evaluation. *NACTA Journal, 56*(4), 2-6.
19. Powdthavee, N., & Vignoles, A. (2009). The socio-economic gap in university drop out. *B.E. Journal of Economic Analysis and Policy, 9*(1), Article 19. Retrieved from https://www.powdthavee.co.uk/app/download/3231532/dropout.pdf

ISBN 978-615-5511-25-7

20. Redmond, P. (2006). Outcasts on the inside: Graduates, employability and widening participation. *Tertiary Education and Management, 12*(2), 119-135.

21. Richardson, J. T. E. (2009). The attainment and experiences of disabled students in distance education. *Distance Education, 30*(1), 87-102.

22. Simpson, O. (2002). *Supporting students in online, open and distance learning.* London: Kogan Page.

23. Stevenson, J., & Clegg, S. (20109. Possible Selves: Students Orientating Themselves toward the Future through Extracurricular Activity. *British Educational Research Journal, 37*, 231-246.

24. Stone, C. (2017). *Opportunity through online learning: Improving student access, participation and success in higher education* (NCSEHE 2016 Equity Fellowship Final Report). Perth: Curtin University, National Centre for Higher Education. [Online] Retrieved from https://www.ncsehe.edu.a/publications/opportunity-online-learning-improving-studnet-acess-participation-success-higher-education/

25. Subotzky, G., & Prinsloo, P. (2011). Turning the tide: a socio-critical model and framework for improving student success in open distance learning at the University of South Africa. *Distance Education, 32*(2), 177-193.

26. Wilde, M. L., & Epperson, A. (2006). A Survey of Alumni of LIS Distance Education Programs: Experiences and Implications. *The Journal of Academic Librarianship, 32*(3), 238-250.

27. Woodfield, R. (2011). Age and first destination employment from UK universities: Are mature students disadvantaged? *Studies in Higher Education, 36*, 409–425.

28. Woodley, A. (2004). Conceptualising student drop-out in part-time distance education: Pathologising the normal? *Open Learning, 19*, 48-63.

ISBN 978-615-5511-25-7

Towards Personalized Guidance and Support for Learning
Proceedings of the 10th European Distance and E-Learning Network Research Workshop, 2018
Barcelona, 24-26 October, 2018
ISBN 978-615-5511-25-7

THE EXPERIENCE OF DISTANCE LEARNERS AS WRITERS

Phil Wood, Bishop Grosseteste University, Palitha Edirisingha, University of Leicester, United Kingdom

Summary

In 2016, we (Edirisingha & Wood, 2018) attempted to develop provision for distance learners on an MA in International Education through the use of a modified version of lesson study, an approach affording the opportunity to consider student learning and practice development (Wood & Cajkler, 2016). One area of student need which became clear in this work was the difficulties experienced by some students in relation to academic writing. Being remote from support, relying heavily on electronic resources with little access to extra support which those on campus-based programmes take for granted, we decided carryout this initial investigation to understand the experiences of these learners as academic writers working at a distance.

Introduction

Whilst distance learning has become an established field of research for practice development, there is relatively little research focusing on the experiences and approaches to writing undertaken by students. Academic writing is the focus of a very large literature, but this predominantly focuses on grammar and structure of writing, as in the English as Academic Practice (de Chazal, 2014), and the emotional impact of the writing process (Huerta, Goodson, Beigi, & Chlup, 2017) rather than understanding the processes utilised by students when writing for assessment purposes.

We were interested in exploring the following questions to focus a preliminary investigation into some of these issues:

1. What is the role of technology in the process of academic writing for distance learners?
2. How do distance learners approach academic writing as a process?
3. What forms of support are used by distance learning students to support their writing?

The programmes we focused on were to masters level programmes in an education department at a UK university. The majority of students were full-time teachers and academics undertaking the programmes whilst in full-time employment.

Methodology

To carry out an initial exploration of student experiences of writing, a simple explanatory mixed methods approach was used during the winter of 2017. After obtaining ethics approval from the university ethics committee, all students on an MA in International Education

(n = 50) and those on a Post Graduate Certificate in Educational Technologies (n = 17) were e-mailed a link to an online questionnaire (Table 1 shows the questionnaire items) together with an invitation to take part in the study and were asked to complete it if they wished. The questionnaire was wholly optional, and it was made clear to students that its (lack of) completion was not linked in any way to their work on the course. Students were asked to include their e-mail address if they were willing to be interviewed online subsequent to completing the questionnaire. In the questionnaire students There were 28 returns (response rate = 42%). Based on an initial analysis of these returns, a set of interview questions (Appendix 2) were developed. The interview text was sent out as an e-mail to complete as an online interview (James & Busher, 2009). Due to time restrictions and the period over which the returns were made it was not possible to send out follow-up questions in a second round of questioning as would normally occur in the online approach to interviewing.

The data were collated for simple descriptive analysis in the case of the questionnaire data, and the interview data were analysed using emergent coding to create a set of basic themes from the data.

Questionnaire Findings

The summary of the results from the Likert Scale items of the questionnaire are shown in Table 1 below.

The results from the questionnaire show that there is a ubiquitous use of technology in the assignment writing process. Students identified that they tend to make more use of tablets, particularly iPads (students on the MA International Education programme are given a complementary iPad when they start the course), for searching for literature and reading that literature once found. This appears to extend to reading on screen rather than downloading and printing off papers for analysis. However, whilst the portability of tablet computers for searching and reading are highlighted, when it comes to writing, there is a greater tendency to use laptop computers. Some students also mention particular Apps at this point, with five students identifying that they hold written drafts on Google-Docs, and 4 students identifying their use of Grammarly for checking and ensuring a good quality of written academic English.

Time is also an issue which appears to be important for students in their writing experiences. Most identify a preference for writing alone, perhaps unsurprising for a distance-learning medium, although a small number of students do state in answers to the later, open questions in the questionnaire that they have found informal collaboration has been a useful part of their work, an observation which is duplicated in the subsequent interview returns. Working alone appears to be an important aspect of their writing experience as many of the respondents identify a need to fit their academic writing around their professional responsibilities meaning that they create personalised rhythms for their writing process. This also means that they are often having to find time in-between other activities. This may lead to a less satisfying experience as the majority of students admit that they do not like writing for short bursts of time. Rather the clear majority prefer to spend extended periods (at least half a

ISBN 978-615-5511-25-7

day) focusing solely on their writing. This appears to suggest that finding time to write is a major challenge for this group of distance learners.

Table 1: Summary results from questionnaire focusing on the experience of distance learners in relation to writing

	Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree
I write using an electronic device (e.g. laptop, tablet) rather than on paper	21	7			
I frequently look at online videos from the course when developing academic writing	9	9	5	3	1
I tend to write by just fitting it in with my work commitments	7	10	7	2	2
I find academic writing stressful	3	12	7	6	
I prefer to write alone, but share drafts with others on my course for comment	7	12	4	4	1
My past experience of writing makes me a confident academic writer	3	10	7	8	
I tend to write when I have a long period (at least half a day) to focus on my writing	13	10	3	2	
I am able to create a coherent argument in academic writing	2	19	6		
My first degree required me to complete written assignments	20	4	1	3	
I make a lot of use of online library resources	24	3	1		
I tend to write in short (1-2 hours) bursts on a regular (3-5 times a week) basis	4	4	4	15	1
I had explicit training in writing assignments in my first degree	1	6	3	9	9
I prefer to write with others, sharing and discussing ideas	1	7	11	8	1
I don't have much confidence when developing academic writing		10	6	12	
I am able to develop critical written commentaries in my writing	1	15	11	1	
I search for and read material for assignments using an electronic device	27	1			
I frequently look back at notes and past readings when developing academic writing	17	8	2	1	
I tend to use any spare time I have to write regardless of duration or frequency.	6	4	5	10	3
I enjoy the challenge of writing, even when it is difficult	8	14	5	1	
I am able to structure a well written assignment	2	19	6	1	
I prefer to write alone, only sharing draft work with a tutor	3	10	8	7	

The students appear to be confident about their writing abilities, but also admit that the process of writing is a challenge. However, a number of those replying to the questionnaire who are close to finishing their courses do state that they feel that they have learned a great deal about academic writing and generally feel more confident than they did at the beginning of the programme.

ISBN 978-615-5511-25-7

The main challenges which writing presents appear to be related to features of distance learning itself. Some commented on the lack of physical resources due to their remote location, for example not being able to easily obtain paper resources such as books which exist in the university library, but which are not held in an electronic format. Two students commented on the lack of immediate tutor availability that can lead to anxiety, which relates to a comment from another student regarding feelings of isolation. The other reflection which came from three students relates to the support given online for assignment writing. Two exemplar assignments were made available but there was little deconstruction of the elements within those assignments or commentary to help students understand the reasoning behind the grades the assignments had been given. This meant that whilst they might be able to deduce elements such as structure and general issues around composition, referencing etc, there was little guidance to help understand the relationship between attained grade and mark schemes or deeper reflections on the detail of the assignments.

Interview findings

The questionnaires led us to focus on several themes in the online interviews:

- time;
- resources;
- networking with others;
- the nature of criticality.

Students found that there were a number of tensions in completing academic work whilst in full-time teaching. Most outlined how they created a clear rhythm in their writing activity, which helped them work productively, often by using set periods of time. For example, Respondent 1 stated,

> *"As I am working full time I would allow myself a two- hour break after arriving home and then would work for a few hours every other day during the week, as the other evenings would be spent for paperwork for work. I would then typically set aside either two half days at the weekend or one full day, so that I could still meet up with friends." (Respondent 1)*

This appears to reflect the questionnaire returns which showed that students prefer to find longer periods of time to immerse themselves in writing as opposed to merely fitting it in at points when they find they have often small, spare periods of time. However, for some students the writing process is much more difficult as they highlight that they are not only challenged by the amount of professional work they have to complete alongside their studies, but also the pressures of family life, for example,

> *"It is not easy to manage, so what I do sometimes is wake up very early to read and write and sometime also stay very late to do same. I have to give my family time in the evening to engage with them and during the day time, I*

ISBN 978-615-5511-25-7

> *have to be at work full time which did not give me time to do anything about my study or assignment." (Respondent 3).*

One interesting aspect of the interview returns was that whilst the questionnaires had suggested that students tended to work alone on their assignment writing, the interviewees gave rich reflections on the networks, predominantly inform in nature, they had relied on when writing assignments. For example, Respondent 2 outlines a number of collaborative activities, from discussing potential topics, to sharing papers. Hence, networks of support were being developed away from the formal structures of the course.

> *"I worked with others somewhat during my writing process. Initially, this involves informal conversations with other students regarding our topics and using each other to informally explore ideas we were considering. There was also the occasional sharing of an article that was relevant to another student's topic. This stage was very useful as it allowed me to get feedback regarding how interesting my topic was to other people in the field and course plus it allowed me to discuss the topic and have other people provide other avenues for me to explore." (Respondent 2).*

Resources from the course were also used to support writing. More than one interviewee highlighted the utility of the exemplar assignments which had been made available, for example, Respondent 4 stated,

> *"I think the examples of proper and successful writing were extremely helpful as they give you an idea of what should be done at this level of academic writing." (Respondent 4)*

Again, this is in contradiction to some of the open responses from the questionnaire, but there may be a level of self-selection bias in the replies from the interviewees. Indeed, there is clear evidence that whilst the exemplars were seen as a useful resource, further contextualization and explanation of them in support of writing would be very useful.

Some respondents also discussed how they had integrated the weekly work activities from their studies into their writing process, showing that they were making direct use of the information and resources to inform their assignment writing.

> *"I relied on the weekly material a lot, in order to inform an understanding of the module which would lead to the choice of topic. I also used the resources listed on the module, both to write my assignments and as a starting point to research more articles by the same authors or on the same subject." (Respondent 5).*

Two respondents also highlighted the importance of contact with tutors as a resource, and in one case (Respondent 1) suggested a way of using this resource more productively to help students in their writing,

ISBN 978-615-5511-25-7

> *"It would be very helpful to perhaps have a time slot (I know this is challenging on a distance learning course due to time zones) whereas students we could have a form of question time with some of the tutors from the course." (Respondent 1).*

Finally, we included a question relating to criticality as we reflected that this is a major focus of writing at masters level, but that there is often an assumption that students understand what it means and how to integrate it into writing without ever understanding if this is actually the case or not. Two respondents left the question unanswered which may indicate a lack of confidence, whilst Respondent 3 gave a useful, simple definition.

> *"I would define Criticality as an in-depth understanding of a particular work concept, which leads to questions as to why the writer is developing his/her writing in such a way, and facts that surround it." (Respondent 3).*

This suggests, alongside previous research we have conducted (Edirisingha & Wood, 2018), that greater support is required for helping distance learners explore the meaning and application of criticality in their writing, a focus which we think may often be ignored in programme materials.

Initial Reflections

Little is known about how distance learners approach their written work, especially in terms of use of resources, the temporal aspects of how written work can be intertwined with professional and personal responsibilities, and how they can best be supported to enable them to reach their academic potential. The initial insights gained from this small-scale study suggest a complex picture of highly differentiated ways in which individuals choose to work. They manage their time in different ways to fit with the idiosyncratic pressures they experience. There is also a spectrum of resource and support use, with some students preferring to work in a very individualistic manner, whilst others begin to form informal support networks. Some students make extensive use of the course resources as a foundation for their work whilst others do not. It is also the case that further support resources are required to help students to fully understand what is expected of them and how to develop their academic writing.

The main elements of the process which show a level of similarity across the cohort are the development of positive working relationships with tutors who are seen as crucial in supporting the writing process, and the ubiquitous use of technologies. However, on this latter point, there is a tendency to assume students know how to make use of technologies to greatest effect, but do we need to consider how to support better, and more critical use of technologies to support writing processes?

References

1. de Chazal, E. (2014). *English for Academic Purposes.* Oxford: Oxford University Press.

ISBN 978-615-5511-25-7

2. Edirisingha, P., & Wood, P. (2018). From Evaluation to Sensemaking: Emergent Development of a Masters Distance Learning Research Methods Module. *European Journal of Open, Distance and E-Learning, Special Issue: Best of EDEN 2016.* Retrieved from http://www.eurodl.org/materials/special/2018/Oldenburg_041_Edirisingha_Wood.pdf
3. Huerta, M., Goodson, P., Beigi, M., & Chlup, D. (2017). Graduate students as academic writers: writing anxiety, self-efficacy and emotional intelligence. *Higher Education Research & Development, 36*(4), 716-729.
4. James, N., & Busher, H. (2009). *Online Interviewing.* London: Sage.
5. Wood, P., & Cajkler, W. (2016). A participatory approach to Lesson Study in higher education. *International Journal for Lesson and Learning Studies, 5*(1), 4-18.

Appendix 1 Questionnaire

Demographics					
Which subject did you study for your first degree?					
How would you describe your current job role?					
How long have you been employed within education or associated fields?					
Prior learning					
	SA	A	A/D	D	SD
My first degree required me to complete written assignments					
I had explicit training in writing assignments in my first degree					
My past experience of writing makes me a confident academic writer					
Technology					
I write using an electronic device (e.g. laptop, tablet) rather than on paper					
I search for and read material for assignments using an electronic device					
Please list any technology you use whilst writing an assignment (include for what purpose in each case)					
Individual to social process					
I prefer to write alone, only sharing draft work with a tutor					
I prefer to write alone, but share drafts with others on my course for comment					
I prefer to write with others, sharing and discussing ideas					
Resources					
I make a lot of use of online library resources					
I frequently look back at notes and past readings when developing academic writing					
I frequently look at online videos from the course when developing academic writing					
Development of writing					
I am able to structure a well written assignment					
I am able to create a coherent argument in academic writing					
I am able to develop critical written commentaries in my writing					
Affective elements of writing					
I enjoy the challenge of writing, even when it is difficult					
I find academic writing stressful					
I don't have much confidence when developing academic writing					

ISBN 978-615-5511-25-7

Rhythms of writing					
I tend to write when I have a long period (at least half a day) to focus on my writing					
I tend to write in short (1-2 hours) bursts on a regular (3-5 times a week) basis					
I tend to use any spare time I have to write regardless of duration or frequency.					
I tend to write by just fitting it in with my work commitments					
Please give a very short account of the positive aspects of your experience of writing your first assignment					
Please give a very short account of the challenges you have experienced in writing your first assignment					

Appendix 2. Interview text and questions

Dear student

Thank you for including your e-mail in the recent questionnaire focusing on experiences of writing as a distance learner. If you are still happy to answer some interview questions that would be great, the instructions are below. If, however, you have now decided not to take any further part in our research, please feel free to stop reading now.

We have included a participant information sheet and an informed consent form (attached) and would ask you to have a look through and sign the consent form if you choose to carry on (an electronic signature is fine).

Below are seven interview questions. You are free to answer these questions either as written responses in a return e-mail, or as a voice recording if you have the kit to record a voice file. Whichever is easier for you. Once you have either typed or recorded responses, please send them to us. The data will obviously be treated confidentially, and any reporting will be either aggregated or anonymised. Once we have analysed your responses, we may want to send through a couple more questions for clarification, but again your decision concerning involvement can be revisited again at that point.

Interview questions.

1. Over the period during which you developed your assignment, please describe your general pattern of work (e.g. did you read and then write, did you read and write in cycles, etc).
2. How did you work with others, if at all, during the writing process? If you did, what do you think are the advantages of sharing ideas and work?

ISBN 978-615-5511-25-7

3. Please describe the nature and impact of any networks of support you engaged with during the writing process?
4. How might the exemplars offered to you be developed as a helpful resource for writing?
5. How did you try to manage the time tensions between full-time work and academic study/writing?
6. If you used the materials from the weekly work packages to inform and help with your assignment writing, how did you do this?
7. How would you define the concept of 'criticality' and how has the writing of your first assignment helped you develop this part of your work, if at all?

ISBN 978-615-5511-25-7

Towards Personalized Guidance and Support for Learning
Proceedings of the 10th European Distance and E-Learning Network Research Workshop, 2018
Barcelona, 24-26 October, 2018
ISBN 978-615-5511-25-7

SCHOLARS' CHANGING SOCIAL MEDIA USE: IMPLICATIONS FOR TEACHING AND LEARNING IN HIGHER EDUCATION

George Veletsianos, Royal Roads University, Canada, Nicole Johnson, Open University of Catalonia, Spain, Olga Belikov, Brigham Young University, United States of America

Summary

Understanding academics' experiences with technology over time is critical in making sense of the use of technology in education and teaching. In this research study we explore whether, how, and why scholars' social media use changes over time. We conducted semi-structured interviews with twelve scholars who were asked to download and reflect upon their Facebook or Twitter archive prior to the interview. Using thematic analysis of interview transcripts, we found that the factors impacting scholars' social media use over time include: personal experiences, professional experiences, issues related to online privacy and self-protection online, evolution of technology, a desire to develop and nurture relationships, awareness of the needs of others, and political environment. Results suggest that the factors leading scholars to evaluate, reconsider, and change their social media practices are complex, layered, and multidimensional. An important implication of these findings is that encouraging social media adoption among scholars, without considering how scholars use them for other purposes, may create future problems for them.

Introduction

The use of social media has become a mainstream practice among scholars, both professionally and personally (Donelan, 2016). While social media adoption is generally positioned as being positive (Brady, Holcomb, & Smith, 2010; Naveh, Tubin, & Pliskin, 2010), advocacy tends to be based on belief rather than evidence (Kimmons, 2014; Selwyn, 2013). Whether it be incorporating social media into teaching practices, using social media to promote their research and publications, or connecting with friends and family, scholars use social media for a variety of purposes (Veletsianos, 2016). Yet, there is a dearth of evidence within the existing body of research as to how scholars' social media use changes over time and the factors that lead to such changes. Understanding changes in scholars' social media use over time is significant because of the pressure that scholars may feel to engage in social media to advance their career (Lowenthal, Dunlap, & Stitson, 2016; Weller, 2011) combined with a lack of evidence as to whether and how such engagement offers career-related benefits (Jordan & Weller, 2018). Furthermore, there are emerging conversations among scholars about the relationship between personal wellbeing and social media use, with scholars describing taking intentional social media breaks in order to improve productivity (Ferguson, 2017; Zellner,

2012). Therefore, the purpose of this research was to explore whether, how, and why scholars' social media use changes over time. In this paper we will describe our findings and discuss the implications of our results as they relate to the roles of teachers and learners in higher education.

Research questions

The following research questions were posed: What factors do academics report as leading to changes in their online participation over time?

Methods

A request for participants was sent to members of an international organization of instructional technology faculty mailing list. Twelve members self-selected and consented to be interviewed for this study.

Interviews were semi-structured and lasted between twenty-five to sixty minutes. Prior to the scheduled interview time, scholars were asked to download either their Twitter and/or Facebook archive and to review their archive independently. During the interviews, we asked scholars to reflect upon what they noticed about how their social media use has changed over time, based on their thinking of the topic, their reflections of their practice, and what they saw in their archive(s). The interviews were recorded and transcribed. Two researchers individually analysed the transcripts using a constant comparative analysis strategy to generate individual lists of codes, which were then compared and combined to generate a list of themes. Researchers discussed the codes and themes with a third researcher and engaged in a process of iterative analysis. Analysis continued until saturation was reached. The themes are described next in the results section.

Results

The analysis resulted in the identification of factors for change in social media use which were then grouped into seven themes. These are listed in Table 1. The themes describe factors reported as influencing scholars' social media use over time. Social media use over time in scholars' lives was found to be complex and resists simple analyses: all scholars reported more than one factor in influencing their use of social media over time, some scholars reported simultaneously increasing and decreasing social media activities, and some factors lead some scholars to reduce their use of social media while leading others to increase their use (e.g., parenthood). Overall decreases appeared to be associated with nurturing offline relationships, improving wellbeing, or self-protection, while overall increases appear to have professional purposes; however, changes reported by scholars were typically related to specific aspects of their social media use such as decreasing the amount of personal content posted but increasing the amount of professional content.

Importantly, themes are not monolithic, as there are significant overlaps between them. For example, Ethan (pseudonym) described a change in his social media use when his first child was born; however, he also acknowledged that the birth of his child occurred at the same time

ISBN 978-615-5511-25-7

that he acquired his first smartphone and he felt that he could not differentiate whether one of these factors was more influential than the other in driving a change in his social media use. With this complexity in mind, we present themes in no particular order and emphasize that no one theme appears as being more influential than the others.

Table 1: Themes influencing changes in scholars' social media use over time (all names are pseudonyms)

Theme	Description	Examples
Personal experiences	Life experiences that are not related to one's career (singular and ongoing experiences such as family emergency, marriage, maturity, moving to a new location, parenthood, personal health issues, and relationship break-ups).	Stella's experience with a physical health issue led her to decrease her social media use because she "did not feel like sharing anything with anyone".
Professional experiences	Experiences and activities related to one's career (singular and ongoing experiences such as conferences, graduation, job loss or transition, professional obligations and expectations, teaching and learning, and stage of career).	Aaron's appointment as Dean at his institution led him to increase his Twitter activity during the time that he held that position, saying, "I would tweet out a lot of things going on in our faculty" as he felt that "it was something I wanted to do… to raise the profile of the faculty." His use of Twitter subsided following his administrative appointment.
Issues related to online privacy and self-protection online	Experiences and/or concerns about others' ability to access content/data and how to protect oneself from harm (e.g. online harassment, identity theft) resulting from this access. Examples include changing one's privacy settings to restrict the audience, not posting on certain topics that might result in misunderstandings or misrepresentation, and adjusting settings to limit the type of content that shows up in one's social media feeds.	Jason's experience dealing with online harassment led him to decrease his Twitter activity and to choose not to make Twitter participation a required component of the courses he teaches.
Evolution of technology	Changes in technology over time (devices and platforms), including the advent of new technologies.	Peter's acquisition of his first smartphone led to a change in the type of content he posted with a shift from primarily text-based posts to an increase in image-based posts.
A desire to develop and nurture relationships	Adoption of certain social media practices to nurture relationships (keeping family updated, posting in such a way that facilitated meaningful discussion, strengthening relationships with colleagues, communicating according to others' preferences). Conversely, respondents also reported decreasing certain social media practices	Erin came to realize that she wanted deeper relationships with her online connections, saying "building a rapport and building some time beyond our work has been also really important to me". Charles described taking "Facebook fasts" to engage in offline quality time with his family as a result of ongoing

ISBN 978-615-5511-25-7

	to nurture offline relationships.	conversations with his wife to set better boundaries around his social media use.
Awareness of the needs of others	Reflection of how one's social media platform and habits can be used to help or support others (e.g. modelling good online practices, sharing content to support others, advocating for other online, and refraining from participating in discussions to create space for marginalized voices to be heard).	Charles' family members' experiences with racism and homophobia led him to post more frequently about these topics as a way to show his support to those family members.
Political environment	The impact of political events (at all levels) and the subsequent changes in political climate, online and offline.	Peter noted how exposure or engagement with controversial issues/debates would negatively impact his mental well-being for several days.

Implications

Our results support the findings of others (Jordan & Weller, 2018; Veletsianos & Kimmons, 2013) that scholars experience tension, having both positive and negative associations when it comes to social media use. Interviewees discussed the professional benefits of using social media to extend their academic reach, to build relationships with other scholars, for teaching and learning, and to stay relevant. Better understanding the positive and negative outcomes of social media use experienced by scholars on a day-to-day basis is critical to developing institutional policies and instructional design that protects scholars' wellbeing while still encouraging the affordances that may improve scholarship and instructional practices.

One implication of this research relates to instructional uses of social media. While faculty are encouraged to adopt social media to enhance instructional practices, this research reveals the intimately personal relationship that scholars have with these tools. Their practices are impacted not just by personal factors, but also by their political leanings and beliefs, as well as by changes that happen around them. Thus, when scholars are encouraged to adopt social media, it behoves academic leaders and instructional designers to recognize that faculty are asked to make decisions divorced from their daily reality of using social media for a variety of purposes that change over time.

A second important implication of this research is the recognition that social media use is impacted by sociocultural factors that change over time. While the majority of literature in the field takes a stochastic approach, examining social media use in faculty lives at particular points in time, this research suggests that scholars engagement with social media is an ongoing event that is impacted by past, current, and future events. For instance, scholars may make decisions to change their current social media practices based on past posts (e.g., while being students), current events (e.g., a new political reality), or anticipated future events (e.g., wanting their children to make decisions about their social media footprint).

ISBN 978-615-5511-25-7

With these implications in mind, institutions have a responsibility to understand the personal, day-to-day effects of social media initiatives for faculty as they relate to sociocultural factors relevant to scholars. For example, does requiring Twitter discussion for an online course put students or faculty at risk of harassment by others who may view the discussion? Does the expectation to engage with academic topics on platforms where their personal and professional identities merge create discomfort for scholars who have varied preferences with regard to what they choose to share and where? These and other questions related to scholars' safety and wellbeing must be considered in order to support scholars' participation in public platforms for online learning purposes.

Conclusion

Understanding scholars' experiences with social media over time is critical for developing institutional policies and directives with regard to teaching and learning online. Social media practices have become mainstream in higher education; however, scholars use of social media is complex and extends beyond their professional lives. If we encourage scholars to adopt social media, then we must consider look at scholars' social media use both including and beyond their teaching role. Furthermore, we must understand factors that influence change in scholars' social media use over time to ensure that any policies or directives do not potentially create future problems for scholars, on both a personal and professional level.

References

1. Brady, K., Holcomb, L., & Smith, B. (2010). The use of alternative social networking sites in higher educational settings: A case study of the e-learning benefits of Ning in education. *Journal of Interactive Online Learning*, *9*(2), 151-170.
2. Donelan, H. (2016). Social media for professional development and networking opportunities in academia. *Journal of Further and Higher Education, 40*(5), 706-729.
3. Ferguson, H. (2017). Building online academic community: Reputation work on Twitter. *M/C Journal, 20*(2).
4. Jordan, K., & Weller, M. (2018). Academics and social networking sites: Benefits, problems and tensions in professional engagement with online networking. *Journal of Interactive Media in Education, 1*(1), 1-9.
5. Kimmons, R. (2014). Emergent forms of technology-influenced scholarship. In M. Khosrow-Pour (Ed.), *Encyclopedia of information science and technology* (3rd ed. pp. 2481-2488). IGI Global.
6. Lowenthal, P. R., Dunlap, J. C., & Stitson, P. (2016). Creating an intentional web presence: Strategies for every educational technology professional. *TechTrends*, *60*(4), 320-329.
7. Naveh, G., Tubin, D., & Pliskin, N. (2010). Student LMS use and satisfaction in academic institutions: The organizational perspective. *The Internet and Higher Education*, *13*(3), 127-133.

ISBN 978-615-5511-25-7

8. Selwyn, N. (2013). *Distrusting educational technology: Critical questions for changing times*. Routledge.
9. Veletsianos, G. (2016). *Networked Scholars: Social Media in Academia*. New York, NY: Routledge.
10. Veletsianos, G., & Kimmons, R. (2013). Scholars and Faculty Members Lived Experiences in Online Social Networks. *The Internet and Higher Education,16*(1), 43-50.
11. Weller, M. (2011). *The digital scholar: How Technology is Transforming Scholarly Practice*. London, UK: Bloomsbury Academic.
12. Zellner, A. (2012, April 13). Digital detox, email vacations, and #twabbaticals. GradHacker Industries Inc. [Blog post]. Retrieved from http://www.gradhacker.org/2012/04/13/digital-detox-email-vacations-and-twabbaticals/

ISBN 978-615-5511-25-7

Towards Personalized Guidance and Support for Learning
Proceedings of the 10th European Distance and E-Learning Network Research Workshop, 2018
Barcelona, 24-26 October, 2018
ISBN 978-615-5511-25-7

VIRTUAL AND MOBILITY ACTIVITIES TO PROMOTE DUAL LEARNING APPROACH IN HIGHER EDUCATION: THE EURODUALE PROJECT EXPERIENCE

Antonella Poce, Maria Rosaria Re, Francesca Amenduni, Università degli Studi Roma Tre, Italy

Summary

EuroDuaLE is an Erasmus+ KA2 project (2015-2018) which aims at promoting innovative and more flexible teaching and learning methods to make highly skilled people an asset for modern societies, reducing unemployment for future graduate generations. Building on existing good practice (i.e. Germany) the goal of EuroDuaLE is to find cost-effective ways for EU Members States to establish and expand the apprenticeship approach, with the development of an integrated transnational Dual Learning framework, where Higher Education Institutions and relevant stakeholders in the labour market establish a synergy and provide students with new curricula, combining formal training and training on-the job, physical and virtual mobility. Nowadays, Dual Learning Systems mainly apply to VET and more technical professions; EuroDuaLE intends to expand the dual scheme to Higher Education Institutions, where students acquire a wider range of knowledge and competences, offering more comprehensive programs, yet including professional and technical training on-the-job. 13 partners from 6 different countries (Italy, Germany, Belgium, Netherlands and Spain) designed, implemented and evaluated a pilot activities of dual learning programmes at European level during the academic year 2016-2017. The Roma Tre research group is partner of EuroDuaLE project and, besides contributing to the various project intellectual outputs, is in charge of evaluating all the related activities. The present paper is focused on the evaluation processes carried out by the Roma Tre team and presents the methodology, the tools and the results obtained within the virtual mobility learning activities, in the framework of the creation and implementation of dual learning pathways at European university level.

State of the art

The crisis which has been affecting the Western world during the last decades, indeed, force to the adoption of different solutions, especially those who have as a target the youngest segments of population, particularly affected by unemployment, as a result of global recession. According to Education at a Glance (OECD, 2017), in most OECD countries, the unemployment rate among younger adults (25-34 years-old) is still very worrying. In general, the risk of unemployment is almost twice higher for younger adults than who have not reached tertiary level of education. Furthermore, the rate of inactive people is more widespread among those who do not have a high level of education. The crisis has boosted the capacity of the impact education can have with the purpose of facing the trends described in

various reports of international organizations which deal with the study of phenomena related to the growth and development of Western countries. In the Education at a Glance (OECD, 2016; p.92), OECD identifies the grounds for this situation, arguing that they may lie in the fact that the market has extremely shrunk, often protecting the oldest generations to the detriment of the youngest, or because the field of study where such young people are specialized were too overfilled or not in line with the labour market needs. High youth unemployment sometimes coexists with greater difficulties in filling vacancies. This indicates imbalances in the labour market, due to skills mismatches, not only technical but also transversal, and limited geographical mobility. Therefore, as recommended by CEDEFOP, tackling youth mismatch and unemployment should be a priority for policy makers. This applies both to vertical mismatch or over-education and to horizontal mismatch, that is, mismatch between a worker's field of study and the content of his/her job (Verhaest et al., 2017). Therefore, the quality of higher education curricula is called into question, as learning programmes are, sometimes, not in line with the labour market and its demands. The European Commission is supporting EU countries and higher education institutions in modernising their education programmes to provide graduates with high-level skills and transferable skills in the rapidly changing labour market. The European Commission has clearly stated in the 2020 Strategy the will for a smart, sustainable and inclusive growth, increasing significantly the investments for higher education, research and innovation. Europe increasingly need people with the right combination of transversal competences, digital skills, creativity and adaptability, together with solid technical knowledge depending on the specific field. It is fundamental to improve the quality and relevance of education provided by Higher Education Institutions; strengthen the interconnections between education, research and business; foster international mobility of students, teachers, staff and internationalize the teaching in itself with ITC tools and virtual mobility (Silvio, 2003).

EuroDuaLE project respond to this call for innovative and more flexible teaching and learning methods to make highly skilled people an asset for modern societies, reducing unemployment for future graduate generations. To facilitate youth integration in the labour market and stimulate job creation, and actual placement, there is need to close the gap between labour demands and people actual training and competences. In this context, Dual Learning Systems seem to have the potential to substantially increase the employability of young people at the end of the educational experience. The strength of dual learning is the possibility of combining theory with practical applications, in cooperation with industries, companies and chambers of commerce (awarding students' qualifications at the end of the dual learning path). EuroDuaLE project aims at promoting and developing dual learning experience at European level, encouraging HEIs to systematically integrate mobility activities into programs, and developing new form of cross-border cooperation to support the quality improvement of higher education, also through new forms of transnational apprenticeship and traineeships to foster youth employability in a global dimension.

ISBN 978-615-5511-25-7

Methodology

The first phases of the EuroDuaLE project consist in analysing and understanding the context in which the European dual learning approach should take place and which are the main issues to take into consideration for a successful implementation of the EuroDuaLE model. With particular reference to young people, the EU Commission launched several programmes to address the problem of youth unemployment: Youth Employment Initiative in 2013 with the aim of strengthening measures defined in the Youth Employment Package; Youth Employment Package in 2012, including Youth Guarantee and the European Alliance for Apprenticeships; Youth on the Move with Youth Opportunities Initiative (consisting of actions supporting people who left school or training to return to school or enrol in vocational training or graduates to get a first work experience) and Your first EURES Job. Among these main measures, some of them (Your first EURES Job, allocations from the ESF to support cross-border mobility schemes, Erasmus+) aim to increase youth mobility in the view of supporting young people to find a job, traineeship or apprenticeship in another EU country. More recently, to support intra-EU labour mobility, the reform of the European network of public employment services (EURES) and related increased resources aim to increase transparency by sharing information about jobseekers and job vacancies, to better support job search and recruitment across Europe and to better connect jobseekers and employers in Europe (Intellectual Output 1, available at http://www.euroduale.eu/images/documents/O1_english.pdf).

EuroDuaLE partners also produced an Analysis of existing dual learning programmes ad drivers for employability, with the aim to explore the state of art of existing dual learning programmes, analysing how they are implemented, regulated and managed, in which frameworks they are comprised, what are the best practices, experiences and the effects of dual programmes (Intellectual Output 2, available at http://www.euroduale.eu/images/documents/O2_english.pdf).

Basing on analyses collected in O1 and O2, EuroDuaLE partners defined how to implement dual experiences in the context of HEIs (Higher Education Institutions), which are the core of EuroDuaLE framework. Features of the framework to be defined are: a European dual learning curriculum (or more curricula), defined through dialogue and collaboration among teachers, students, graduates and labour market actors, drawing on new methods of teaching and learning such as e-learning and work-based learning; a scheme for the mobility activities; a system of evaluation of competences acquired during the dual learning experience. Partners developed a "prototype", composed by common principles and practices, which can be applied in different sectors, nations and contexts. The leading idea is not to add a bit of practical learning to the “normal” curriculum, but to well coordinate theoretical and practical learning and to combine the learning places, learning concepts and learning methods, so that the needed competences and skills can be developed optimally (Intellectual Output 3, available at http://www.euroduale.eu/images/documents/Intellectual-Output-3.pdf).

ISBN 978-615-5511-25-7

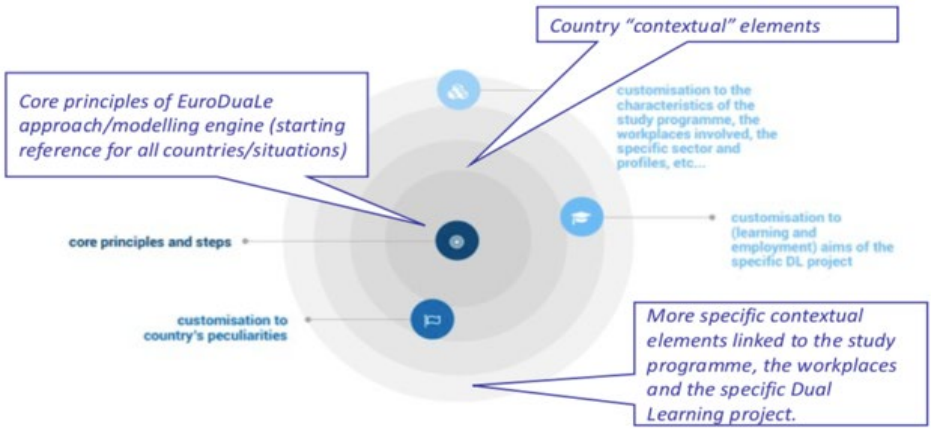


Figure 1. The Core components of Dual Learning in EuroDuaLE Methodological Framework (http://www.euroduale.eu)

Intellectual Output 4 completes the process started in IO3, being the second step in the design of a cooperation scheme for transnational dual learning. Basing on methodological model designed in O3, Partners worked on practical aspects and implications of the transnational cooperation framework. The Handbook is a practical support for participants, in which the process of implementation of EuroDuaLe is defined step by step. In particular, basing on the previous analysis, Partners will define: organisations involved; learning activities; a regulatory framework that would allow HEIs to participate in dual learning programmes; a schedule for the evaluation of competences. The Practical Handbook aims to guide designers (HEIs, companies, associations, social parts, policy makers) of similar experiences through the real implementation of the model, but it will also contain a toolkit to help different stakeholders with management practices (The Handbook is available at http://www.euroduale.eu/images/documents/Intellectual-Output-4-final2.pdf).

Partners, after defining the methodological framework (O.3) and the practical handbook (O.4), they foresaw a piloting phase, where the cooperation framework for dual learning mobility was put in place and evaluated against the real experience. A number of students was selected by the Universities involved to enrol in the dual learning programme combined with a period of work abroad. A total of 30 students has been involved, selected as follows:

- 9 students for each Italian University (UNIMORE, University of Padua);
- 9 students from the German University (Otto-Von-Guericke University of Magdeburg);
- 7 students from the Belgian University (UC Leuven);
- 5 students from the Spanish University (University of Seville).

Mobility happened in two forms: 25 days of Virtual Mobility over a period of about 2 months and 15 days of physical mobility.

Virtual Mobility has a great potential to contribute to the internationalisation and opening up of HE by creating international, collaborative experiences for educators and students as well as equal possibilities of participation in exchange programs, including those who are unable to travel for social, financial, or other reasons (EuroPACE, 2010; De Gruyter et al., 2011).

ISBN 978-615-5511-25-7

EuroDuaLE Virtual mobility experience addresses the need of enhancing transparency and providing accessible opportunities for achievement of Virtual Mobility Skills by supporting higher education teachers and students in acquiring and developing key competences needed to successfully design, implement and participate in Virtual Mobility Actions, including cooperation, leadership, intercultural, foreign language and digital skills. Virtual Mobility emphasizes cross-border collaboration with people from different backgrounds and cultures working and studying together, aiming at the enhancement of intercultural understanding and the exchange of knowledge by using information and communication technologies (ICT) to obtain the same benefits as one would have with physical mobility but without the need to travel (Schreurs et al., 2006; Tereseviien et al., 2011). In this sense VM can be considered as a source for a successful participation in today's global and digital society and a condition for starting a dual learning programme in foreign country context.

EuroDuaLE Virtual mobility experience was carried out through the use of a series of online courses (OERs and MOOCs) made available through a Moodle platform dedicated to the students involved. The courses, chosen by the students' academic tutors, mainly concerned transversal skills such as critical thinking, communication, collaboration, creativity and team working. The online courses and resources were not created by the project partners but selected from a first analysis and collection of OERs on Virtual Mobility skills. The mobility phase was carried out thanks to the collaboration between 3 main actors: the sending university, the receiving university and the host company. The sending university selected the students for the dual learning experience on the basis of internal and national regulations. The receiving university had the task of searching and selecting a company aimed at hosting the students identified by the sending university, taking into the university course field of study and learning objective. Then, the selected company filled in, together with the university tutor and the student involved, the learning agreement, the core of the dual learning experience to be implemented in 15 days.

The Roma Tre research group, coordinated by A. Poce, took part in different intellectual output and led the evaluation (Intellectual Output 6) of all the activities carried out within the project itself: partners' meetings, multiplier events, outputs activities and the pilot phase. As the scope of the evaluation is to assess the validity and transferability of the core elements of the EuroDuaLE framework, the evaluation tools and results produced in the pilot phase should be considered important for the definition of future development of dual learning path definition, at European and university level. Partners involved in the pilot phase had the possibility to evaluate the different steps of the experience, in terms of clearness of the learning objectives, collaboration between HEI – Student – Company, technical and transversal skills development, connection between curriculum and work experience, helpfulness of HEI tutor and Company tutor in problem-solving, effectiveness of transnational aspect. The Roma Tre research group designed and implemented the evaluation tools used during the pilot phase and analysed the evaluation data. Part of the analysis carried out are presented in the following paragraph.

ISBN 978-615-5511-25-7

Evaluation of the dual learning experience

In order to compare perceptions and experiences of the 3 group of participants involved in the project, it was developed a self-assessment survey. The self-assessment survey gives a chance to all the EuroDuaLe parties (students, sending university, receiving university and company tutors) to express their opinion and level of satisfaction regarding the different phases and parts of the mobility experience. The survey has three versions, students' version, company tutor version and the academic tutor version.

The self-assessment survey was made available in two forms, pdf document and an online version (Google® forms). All three versions of the self-assessment survey were made available from the 19th of March 2018. In this paper we will show the responses on the surveys which were collected on the 1st of July 2018 and including 23 students (6 from Belgium, 5 from Spain, 5 from Italy and 6 from Germany) out of the expected total number of 30 students. The questionnaires include both close questions on Likert scale (1 = *strongly disagree*; 2 = *disagree*; 3 = *undecided*; 4 = *agree*; 5 = *strongly agree*) and open ended questions. In the following table, it is described which sections are investigated by each questionnaire. Common sections among questionnaires were thought to compare the participants' perceptions about common themes (e.g. Virtual Mobility and Physical Mobility) in order to see whether there are coherent perspectives or not.

Table 2: Evaluation indicators for the three different groups of respondents

	Virtual Mobility – Digital platform and contents	Physical Mobility – Organizational aspects	Physical Mobility – Relevance of the experience	Skills self-assessment
Students	X	X	X	X
Academic tutor	X	X		
Company tutor		X	X	

Analysis and findings

Here will be presented some descriptive data collected from the students' questionnaire.

Virtual Mobility – Digital platform and contents

In the virtual mobility part of the self-assessment questionnaire, 3 students out of 23 chose not to answer that part. More than half of the students have found the online platform user friendly and about the 10% of the students didn't think that it was much intuitive. About 50% of the students thought the log book was useful whilst about 30% didn't. Most of the students think that contents were well organized while about 34% are undecided and less than 20% thought that materials were not well organized. In the same way, more than 50% agreed that web contents were sufficient whilst about 28% was undecided and less than 20% thought that they were not sufficient. Overall ⅓ of the students thought that Virtual Mobility was integrated with the physical mobility, ⅓ was undecided and ⅓ didn't agree.

ISBN 978-615-5511-25-7

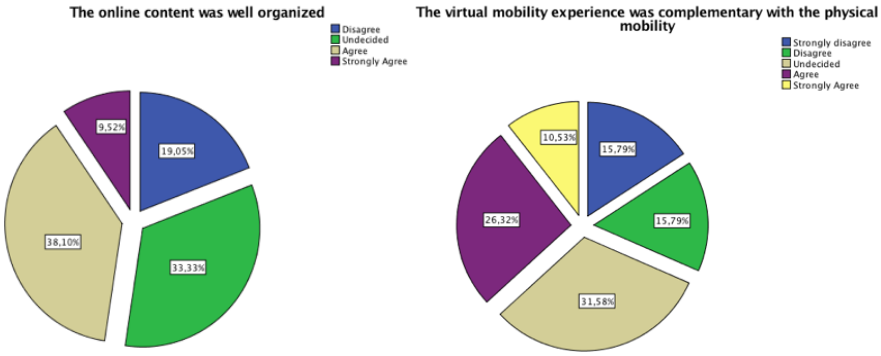


Figure 2 - 3. Evaluation results of students' virtual mobility experience

Physical Mobility – organizational aspects

Regarding the placement phase, students were asked to express their opinion on the experience. Almost all students agreed that the organizers of the placement (receiving company, sending university and receiving university) were helpful in solving their problems and offered sufficient support to them. There are some reservations regarding the duration of the placement (15 days), about 26% of students are undecided on whether the duration of the placement was sufficient, about the 30% of students believe it was sufficient and fulfilled the objectives specified in the learning agreement, while the 40% disagree.

Physical Mobility – relevance of the experience

From the pie charts below, all students had an overall positive placement experience, which can be seen in their expressed opinion on the statement "A placement abroad, and not locally was beneficial to my professional curricula". The students felt the placement experience was beneficial to their field of study. Students believe that having a placement abroad has improved their professional curricula more than what a local placement would have.

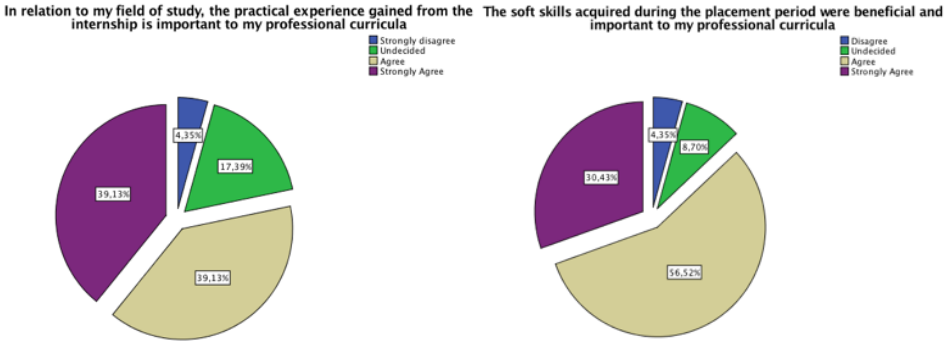


Figure 4 - 5. Evaluation results of students dual learning experience

ISBN 978-615-5511-25-7

Figure 6. "Project" and "Experience" Link of words in the open-ended question "Describe in few words your overall experience in the EuroDuale project" (made by voyant-tools.org)

Physical Mobility – Skills self-assessment

Students were asked to self-assess their skills after the placement experience (Poce et al, 2015). The table shows that four skills are well developed (3.5 < average < 4) which are planning, collaboration, communication and attitude to research. Students perceive that communication skills are the most developed with an average of 3.9. Four skills are sufficiently developed (3 < average < 3.5) which are critical thinking, problem solving, digital skills and creativity whilst only one skill is poorly developed (average < 3) that is entrepreneurship. The student perceptions are coherent with their professional experience. Indeed, they were not required to develop their own business idea but they were introduced into workplaces in a foreign country, where they needed to learn how to collaborate and communicate in an international work team.

Table 2: Soft skills self-assessment data

	Average	SD
Entrepreneurship	2.8696	1.32474
Creativity	3.0000	1.27920
Digital skills	3.3043	1.25896
Critical_thinking	3.3043	1.10514
Problem_solving	3.4783	0.94722
Collaboration	3.5238	0.92839
Planning	3.7826	1.04257
Attitude_to_research	3.8261	1.19286
Communication	3.9565	0.70571

Conclusive remarks

The overall experience was assessed positively by all the participants, although the is room for improvement. Students thought that the placement experience was relevant for their curricula and recognized that the professional experience helped them to develop soft skills, more specifically communicative and collaborative skills. The organizational relationship among students, host university, sending university and company worked without difficulties.

ISBN 978-615-5511-25-7

As regards virtual mobility experience, it has proved to be a good educational tool for starting dual learning experiences at university level: through activities of transversal skills development, students have had the opportunity to acquire theoretical knowledge that they put into practice during the mobility experience at the foreign company. This experience of using virtual mobility in contexts of dual learning has allowed to highlight the possible future evolutions of the tool within the apprenticeship learning path. Virtual mobility can be used to promote culture and language knowledge of the foreign country where the future apprenticeship will take place, or it can be the tool through which the company will assign the first work tasks or develop the necessary technical knowledge before the mobility phase. Thanks to the supervision of the academic tutor in the construction of virtual mobility pathways, the whole experience will be well-defined from a pedagogical point of view and will be built with the joint contribution of two dual learning training institutions: university and company.

However, some challenges emerged from the participants' answers. First of all, it could be useful to think about the duration of the placement, because it was a critical aspect for students. The pilot phase carried out within the project cannot be defined in terms of dual learning, but in terms of short apprenticeship experience: the extension of the duration of the experience is necessary in order to talk about a dual learning system at university level.

The data here presented are preliminary. We are still collecting data from students, university tutors and company tutors' questionnaire in order to compare the perceptions of the all participants.

References

1. Bannan-Ritland, B. (2003). The role of design in research: The integrative learning design framework. *Educational Researcher, 32*(1), 21-24. doi:10.3102/0013189X032001021
2. De Gruyter, J., Achten, M., Op de Beeck, I., & van Petegem, W. (2011). Virtual Mobility: Definition and Types. In Achten M., Op de Beeck I., & van Petegem W. (Eds.), *Home & Away Forum: Conference Proceedings*. EuroPACE ivzw: Heverlee.
3. EuroPACE, (2010). Retrieved November 15, 2010, from Interests – Virtual mobility: http://www.europace.org/interest3.php
4. European Centre for the Development of Vocational Training – CEDEFOP (2010). *The skill matching challenge. Analysing skill mismatch and policy implications*. Luxembourg: Publications Office of the European Union. ISBN 978-92-896-0485-7
5. OECD (2016). *Education at a Glance 2016: OECD Indicators*. Paris: OECD Publishing. http://dx.doi.org/10.187/eag-2016-en
6. OECD (2017). *Education at a Glance 2017: OECD Indicators*. Paris: OECD Publishing. http://dx.doi.org/10.1787/eag-2017-en

ISBN 978-615-5511-25-7

7. Poce, A., Agrusti, F., Re, M. R. (2015). Sviluppo di uno strumento di valutazione delle risorse aperte (OERs) – Analisi dei dati raccolti: abitudini nell'uso della tecnologia e di scrittura. *CADMO, Giornale Italiano di Pedagogia sperimentale. An International Journal of Educational Research*, XXIII(2), 86-92.
8. Schreurs, B., Verjans, S., & van Petegem, W. (2006). *Towards Sustainable Virtual Mobility in Higher Education Institutions*. EADTU Annual Conference 2006.
9. Silvio, J. (2003). Global Learning and Virtual Mobility. In T. Varis, T. Utsumi, & W. R. Klemm (Eds.), *Global Peace Through the Global University System*. Hameenlinna, Finland: University of Tampere.
10. Tereseviien M., Volungeviien A., & Dauksien E. (Eds.) (2011). *Virtual Mobility for Teachers and Students in Higher Education - Comparative research study on virtual mobility*, Kaunas. Retrieved from http://www.teacamp.eu/sites/default/files/Teacamp_book_final_final20110606.pdf
11. Verhaest, D., Sellami, S., & van der Velden, R. (2017). Differences in horizontal and vertical mismatches across countries and fields of study. *International Labour Review, 156*(1), 1-23.

Acknowledgement

A. Poce coordinated the research presented in this paper. Research group is composed by the authors of the contribution that was edited in the following order: A. Poce (State of the Art, Conclusive remarks), M. R. Re (Methodology, Evaluation of the dual learning experience), F. Amenduni (Analysis and findings).

Towards Personalized Guidance and Support for Learning
Proceedings of the 10th European Distance and E-Learning Network Research Workshop, 2018
Barcelona, 24-26 October, 2018
ISBN 978-615-5511-25-7

BEST PRACTICE FOR SUPPORTING STUDENTS IN THE WORKPLACE

Fiona J. Aiken, Hilary A. MacQueen, The Open University, United Kingdom

Summary

We investigated the academic performance of distance-taught student Paramedics and the effect of workplace support measures offered by their employers. Using a combination of quantitative, qualitative and open text data, we identified factors important for student success and well-being. Dedicated study time was not a significant predictor of student success, but was related to the quality of achievement as measured by pass grade. More important for success were less tangible factors such as relationship with a mentor, and being part of a supportive peer group. It is important to accord prominence to these features, and to build them into new course design. Care must also be taken that placements elsewhere be well organised, and students proactively supported while undertaking them.

Introduction

Students who are learning in their place of employment have a learning experience that is different from those of their peers learning on campus, or on a distance learning programme (Tynjala, 2008). The Open University (OU) has limited experience of work-based learning (WBL) as it differs considerably from the manner in which the majority of its distance learning curriculum is delivered, which is by tutor-supported blended learning. However, the students on the Foundation Degree in Paramedic Sciences, which was offered from 2009-2016, were work-based students. Responsibility for these WBL students was shared between the OU and the employer: each had specific responsibilities towards the student. Internal survey data showed that the WBL students were generally happy with their OU Tutor support but many claimed that they did not receive adequate support from their employer. Employers confirmed that they did fulfil their obligations towards the students, and indeed there was a high rate of achievement for WBL students; nevertheless, there was considerable diversity in the level of support given to students in the workplace and in satisfaction surveys many students reported high levels of anxiety, frustration and unhappiness during their studies.

The aim of this research was to identify factors in the workplace that impact on the student's learning journey. In addition to the normal satisfaction surveys completed by students during their studies, we asked graduates of the Foundation Degree in Paramedic Sciences to reflect on their experiences of WBL by means of a survey questionnaire designed to probe both quantitative (such as facilities and opportunities provided by the employer) and qualitative (such as whether the student felt part of a learning community) factors.

The results from the survey allowed us to identify factors that students feel are important for their success while studying in the work place. They have been used to inform plans for other WBL and Apprenticeship initiatives currently being undertaken within the OU to ensure that the students can be fully supported both by the university and the employer.

Methodology

Ethical approval for this project was obtained from the Open University Human Research Ethics Committee, and the online survey was designed with help from Dr Doug Clow and the Student Research Project Panel, who also administered the survey. Participants were recruited from among students and graduates of the Open University's Foundation degree in Paramedic Sciences. Their responses related to their time studying the capstone WBL module, a 60 credit module studied over 17 months in parallel with other, distance-taught, modules. All student enrolment to the Foundation degree was from pre-existing employees in the Ambulance service (98% in UK National Health Service and 2% in independent organisations), mostly working as Emergency Care Assistants or equivalent roles, and wishing to become registered Paramedics. Students were supported and sponsored by their employers, who undertook to provide them with suitable facilities and learning opportunities, and a workplace mentor. Employers were also responsible for arranging practice placements for their student Paramedics. Such placements are an essential component of Paramedic training, so hold considerable importance within the Foundation degree. Although employers were advised to give the students protected time to study, not all of them did so, and students frequently had to use their annual leave to complete their studies.

Six cohorts of students were surveyed in this study (n = 339). Anonymised demographic data were obtained from university records, and in the first part of the study responses were collected from the end-of-module survey that was sent to all students upon completion of the module. For the second part of the study, graduates of the programme were invited to participate in a further survey that probed more deeply into their experiences as a student and included categorical, semi-quantitative and open text questions (the survey questions are available on request). There was a low response rate (7.7%) for this part of the study, and only 26 individuals completed the survey. All respondents were from England.

Quantitative analyses were carried out using Microsoft Excel® and GraphPad Prism v5 (GraphPad Software, San Diego, California, USA, www.graphpad.com). Textual analysis was carried out using NVivo (QSR International Pty. Ltd., www.qsrinternational.com).

Results and Discussion

Participant demographics

Participants ranged in age from 28 to 58 (mean = 42) years. All were Caucasian. The gender balance was skewed, with 38% respondents being female and 62% male, and this is consistent with the overall gender balance among paramedics in England (40% female; HCPC Statistics). 64% had their studies paid for by their employer and the remaining 36% paid for themselves. Participants had a range of prior educational achievements upon starting the qualification:

ISBN 978-615-5511-25-7

27% had no formal secondary school leaving qualifications (UK A Levels), 42% had secondary school leaving qualifications (A Levels or equivalent), and 31% had experience of tertiary education. Overall, 92% of students subsequently applied to become registered Paramedics. This strong result indicates that in spite of set-backs (perceived or real) experienced by students, the Foundation Degree was designed in such a way as to give even low academic achievers a chance to progress in their chosen career. One participant commented:

> *"A very good course and great way of learning to become a Paramedic."*

Macro effects of the workplace environment

The first part of this study, involving three student cohorts (n = 169), investigated whether the facilities provided by employers, and particularly the amount of protected study time allowed, affected student performance. Figure 1 shows that only 8% of respondents said that their employers had given them protected study time. This is in contrast to the large number who were provided with a computer (60%) and with skills workshops (77%).

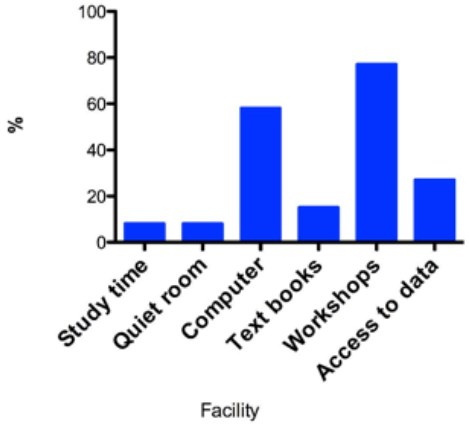


Figure 1. Percentage of respondents able to access study facilities

Macdonald et al (2010) have emphasised the need for dedicated study time for student success. We compared the pass rates and the quality of the pass (as judged by scores above 70% in the summative assessment) achieved by students in three different NHS Ambulance Trusts and a small group of independent providers. The results are shown in Table 1.

Table 1: Pass rate and pass quality for students from different employers. N.D., not declared.

Employer	Study days per year	Pass rate (%)	Percent of students achieving scores >70%
NHS Trust 1	17.5	94	28
NHS Trust 2	29	85	46
NHS Trust 3	0	89	34
Independents	N.D.	56	10

Surprisingly, among the NHS Trusts there was no effect of study days on pass rate, but there was a significant effect on pass quality ($P = 0.02$, ANOVA). There was also a significant difference in both pass rate and pass quality achieved by students from NHS Trusts compared to those from the independent providers ($P = 0.04$, Fisher's Exact test).

ISBN 978-615-5511-25-7

The clear differences between students working in NHS Trusts and those in independent providers suggested that the better infrastructure in NHS organisations, and perhaps consequently a supportive environment, is an important component of student success. However, even successful students complained about the level of support they received in the workplace. For example, only 47.9% felt that the feedback they received on their practice was good, only 43% felt that they were well supported by their placement provider, and only 13% felt that their Mentor understood their needs. These results prompted us to extend our initial analysis to explore workplace support in more detail.

Micro effects of the workplace environment

In the second part of this project we used a targeted survey to gain more insight into students' practical and emotional needs in the workplace. We sought to collect information about real workplace conditions (as opposed to what employers told us) and to identify factors that are important for student success in workplace learning.

A common cause for complaint was the practice placements that student Paramedics are required to undertake. As noted above, the organisation of these was the employers' responsibility, but in fact almost 58% of the placements were organised by students themselves. Many experienced difficulties in doing so, in finding time to undertake them, and in feeling supported while they were there. Sample quotes included:

> *"Employer did not give us time off to attend placements or study leave or workshops. All this had to be in our own time."*

> *"Some placements clearly wanted me there and helped me learn, others weren't so keen and made it clear."*

> *"Because they were self organised, I had to 'stay under the radar' e.g. I spent a tremendous week on the paediatric ward of a hospital based on friendship with a consultant and had to avoid their hospital placement officer."*

The importance of peer support for students has been previously reported (Tout et al, 2014; Borrott et al, 2016), and this factor also emerged in our study. As well as practical problems, students also seemed to lack emotional support in their workplace. Work-based learning students were generally not part of a lively student community. Only 8% had many other students in their workplace, and 12.5% were the only student there. These numbers may have contributed to students' feelings that they were unsupported: only 8% felt well supported, and 46% felt somewhat or completely unsupported. This lack of peer engagement and support is not conducive to student success. Some proactive students made efforts to establish their own peer support groups:

> *"Very supportive crewmates."*

ISBN 978-615-5511-25-7

> *"I had limited opportunities to work with my mentor so ended up with a group of colleagues that I'd built 'trust relationships' with and I tended to approach them on issues relating to their strengths and experience."*

Nevertheless, in contrast to the last comment, 84% of students found their mentor easy to contact, and 77% had a close working relationship with their mentor. The importance of an effective relationship with a workplace mentor has been reported elsewhere by McDonagh et al (2010), Tout et al (2014), and Kramer-Simpson (2018).

We asked respondents to identify other concerns that they had about the workplace learning experience. Analysis of the free text answers provided by the respondents produced the word cloud shown in Figure 2.

Figure 2. Word cloud derived from free text responses

It is clear from this figure that time management was a major factor for students on this programme. These students, all of whom were in full-time employment, had a working pattern of 12 hour shifts, changing between day and night, and with compulsory overtime during busy periods. In light of this it is not surprising that students felt that they could not easily fit additional study into their normal days, and were compelled to use their annual leave to complete their study tasks (see above). It might be hypothesized that the provision of ring-fenced study time might alleviate this problem, but our quantitative findings (Table 1) showed no significant effect of allocated study hours on pass rate. This does not, of course, provide a measure of student contentment, and this is perhaps better correlated with the effect on pass quality that we report here.

When asked what advice they would give to other students undertaking a WBL programme, participants clearly articulated the negative effect of their perceived time pressure:

> *"Good time management. Great experience to work and practise what you are learning."*

> *"Talk to your […] mentor if you are struggling. They've seen it all before and know how to help."*

ISBN 978-615-5511-25-7

> *"Fully engage with it throughout because something that doesn't seem relevant at the beginning certainly proves useful later."*

> *"Keep at it, don't give up."*

The end-of-module surveys used in this project are given to students when they are still immersed in their studies. This means that the responses are not necessarily very objective, being coloured by the students' most recent experiences. By inviting graduates of the Foundation degree to offer their views, we hoped to capture the benefits of their more measured hindsight and perspectives. We received many more positive comments:

> *"At beginning seemed quite daunting however once completed very glad to have had this opportunity and to become a paramedic at the age of 52. Proved to myself that I could do it and now enjoying a challenging job."*

> *"I enjoyed it and admit to working diligently throughout completing all the tasks/activities."*

> *"A very good course and great way of learning to become a Paramedic."*

Conclusions

By eliciting the views of successful graduates from the Paramedic Sciences Foundation degree, and combining them with the views expressed in within-course satisfaction surveys, we have been able to explore more deeply the factors that are important for the success of predominantly distance taught students learning in the workplace. Distance learning is an established and respected method for teaching health care (and other) students (Dodds, 2011), but it seems clear that such students have particular requirements that are important for their success and well-being. Although there was no statistically significant relationship between protected study time and student success, there was an effect on the level of achievement (Table 1). Moreover, since almost all students commented on the time pressures of their study (Figure 2) it is likely that a perception of time pressure contributed to raising stress levels and negative feelings. We would recommend that this be borne in mind when designing WBL curriculum.

Where placements are a component of the WBL, it is important to ensure that they are properly organised and that students are supported in their placements both by their employer and by the placement providers. It is not conducive to a successful placement if students are made to feel unwelcome and an encumbrance (Dornan et al, 2009).

Finally, an important factor for student well-being is the amount of day to day support they receive from both their peers and their workplace mentors. Where students are not part of a large student community in the workplace, the suggestion of "student rovers" (Tout et al, 2014) could be considered. Furthermore, training and development of mentors, such as that suggested by NHS Education for Scotland (2008), should certainly be factored in to course planning.

ISBN 978-615-5511-25-7

References

1. Borrott, N., Day, G.E., Sedgwick, M., & Levett-Jones, T. (2016). Nursing students' belongingness and workplace satisfaction: Quantitative findings of a mixed methods study. *Nurse Education Today, 45*, 29-34. doi: 10.1016/j.nedt.2016.06.005
2. Dodds, T. (2011). Open and distance learning for health: Supporting health workers through education and training. *Open Learning, 26*(2), 173-179. doi: 10.1080/02680513.2011.567757
3. McDonagh, L., Draper, J., Davies, G., Mowbray, W., & Gallagher, D. (2010). Working at the coalface: The contribution of programme tutors in supporting practice-based learning in nursing. *Proceedings of the Nurse Education Today Conference*, 7-9 September 2010, Cambridge, UK. http://www.jillrogersassociates.co.uk/images/stories/NET_conf_pdfs/PhotosNET2010/NET2010 Abstracts booklet.pdf
4. Dornan, T., Scherpbier, A., & Boshuisen, H. (2009). Supporting medical students' workplace learning: Experience-based learning. *The Clinical Teacher, 6*, 167-171.
5. Health and Care Professions Council Statistics (2018). *Gender balance among Paramedics.* Retrieved 6 July, 2018, from http://www.hpc-uk.org/aboutregistration/theregister/stats/
6. Kramer-Simpson, E. (2018). Moving from student to professional: Industry mentors and academic internship coordinators supporting intern learning in the workplace. *Journal of Technical Writing and Communication, 48*(1), 81-103. doi: 10.1177/0047281616646753
7. Macdonald, I. S., Bullen, M., & Kozak, R.A. (2010). Learner support requirements for online workplace training in the South African furniture industry. *Journal of Asynchronous Learning Networks, 10*(3), 48-58.
8. NHS Education for Scotland (2008). *Generic Guiding Principles for those supporting learning in the workplace.* Edinburgh, UK.
9. Tout, D., Pancini, G., & McCormack, R. (2014). Using mobile peer mentors for student engagement: Student Rovers in the learning Commons. *Higher Education Research and Development, 33*(3), 595-609. doi: 10.1080/07294360.2013.841645
10. Tynjala, P. (2008). Perspectives into learning at the workplace. *Educational Research Review, 3*, 130-154. doi: 10.1016/j.edurev.2007.12.001.

Acknowledgements

We would like to acknowledge the assistance of Doug Clow and Glen Dickinson in acquiring data. This project was funded by eSTEeM – The OU centre for STEM pedagogy. Project Reference 17E-HM-LHCS-01.

ISBN 978-615-5511-25-7

Towards Personalized Guidance and Support for Learning
Proceedings of the 10th European Distance and E-Learning Network Research Workshop, 2018
Barcelona, 24-26 October, 2018
ISBN 978-615-5511-25-7

ACHIEVING STUDENT CENTRED FACILITATION IN ONLINE SYNCHRONOUS TUTORIALS

Diane Butler, Lynda Cook, Vikki Haley-Mirnar, Catherine Halliwell, Louise MacBrayne, The Open University, United Kingdom

Summary

The advent of digital capabilities in synchronous communication technologies has enabled the UKOU STEM faculty to move much of its tutorial provision from a face-to-face setting online. Direct observation, in this study, of around 70 hours of online tuition has revealed that the ethos of student centred facilitation, which previously characterised most OU face to face tutorial provision has now largely been lost. Despite the affordances of interactive tools within the platform used for tuition (Adobe Connect), staff delivering synchronous online tuition have largely adopted a didactic approach with a focus on *content to cover*. Interviews with staff in this study reveal significant frustration that students are not more active participants within tutorials and describe how their best effects to foster staff to student and student-to-student interactions frequently meet with failure. Student satisfaction with tuition experiences, however, is high with most students describing tutorials as highly valuable to their learning. In addition, data analytics reveal that many students make significant use of recordings of synchronous tutorials and frequently, by choice, rarely attend sessions live. Student surveys and in-depth interviews with students and staff reveal a lack of shared understanding of the role of tutorial provision within our distance-learning context.

Introduction

The majority of UKOU modules in Life and Health Sciences use online delivery for synchronous tuition. This includes tutorials, led by an Associate Lecturer (AL or tutor) to different sized groups of students. The purpose of this tuition is to complement the supplied and very comprehensive distance learning materials (a *flipped classroom* approach), providing an opportunity for students to work in a group setting with a tutor to develop an understanding of previously studied material.

Within the Open University supported open learning model, tutorials have long served to reduce the sense of isolation felt by distance learners and provide opportunities for active learning with student peers, guided by ALs. In a distance learning setting these synchronous events provide rare opportunities for discussion, group activities and collaborative work. Since the UKOU's inception, ALs have been encouraged to offer student centred sessions, placing the learner and their needs at the heart of the tutorial agenda and choosing activities that promote active learning–the very essence of the social constructivist approach seeking to

promote deep learning. Until recently all tutorials were run as face to face events in study centre venues, relatively local to the student populations they served.

Within the last 10 years, the advent of digital capabilities in synchronous communication technologies has enabled the UKOU STEM faculty to move much of its tutorial provision online. In Life and Health sciences all tutorials now take place in online rooms (formally an OU licensed version of Blackboard Collaborate, more recently, Adobe Connect). The current model of tuition favoured by the university organises tuition at different scales. The smallest scale encompasses sessions at the level of the tutor group (around 20 students) in sessions with their *own*, personal module tutor. Tutorials are also offered at a larger scale to several tutor groups' students simultaneously or even at the level of the module where potentially as many as 200 or more students may attend the session. These sessions are led by a team of ALs, some not personally known to the students. Attendance at tutorials is not mandatory and for many, tuition is seen very much as an adjunct to the study of the core distance learning materials. On moving tuition online there was an initial expectation that attendance would improve since the barriers to attendance were reduced (travel, transport costs, caring duties). This has proved not to be the case with many students citing difficulties around tutorial attendance including other commitments clashing with scheduling, or simply not having sufficient time to attend. For accessibility reasons, most OU tutorials are recorded so all students can access a play back of the session when convenient if they choose to. This could be seen as a significant advantage of online tuition; as potentially more students can benefit than with the traditional classroom based tuition model.

Training for ALs sought to encourage skill development around the use of the interactive tools offered in the online room, including the tutor and student use of the microphone and a chat box, break out rooms for group work, an interactive whiteboard with drawing tools, a quiz tool and a polling tool to answer questions as a group. The use of these interactive tools was expected to lead to fully student centred tutorials with ALs acting as facilitators and not lecturers.

Many stakeholders feel however, that it has proved difficult to replicate the flavour of the former face-to-face OU tutorials online. Frequent barriers to successful online tuition experiences are connected to access, hardware and software. Both ALs and students have expressed a certain lack of confidence in the online learning environment, describing difficulties with sound quality and the general stability of the platform.

The advent of recorded online tutorials affords a method by which students may *attend* tuition events asynchronously (learning analytic tracking system records tutorial viewings). The issue for the institution here is complex. If students can choose to either *download* a tutorial experience or to attend synchronously then how should the session be designed? Is it possible to design a tutorial that does actually meet the needs of both sets of learners (balancing the amount of interactive, student centred content for the students attending live, while still ensuring students watching the recording have something comprehensible to view) and in attempting to do so are we unintentionally subverting the ethos of the tutorial as the

ISBN 978-615-5511-25-7

vehicle for the social, the reflective and experiential aspects of the learning model (Conole, 2004)?

By the inception of this study, online tuition was well established as the sole mode of tuition delivery in Life and Health Science modules and ALs had had time to develop skills within the online environment. It was therefore prudent to investigate and explore, very comprehensively, what ALs and students actually did in online tutorials and to discover if this matches expectations of the traditional student centred style. We were also interested in AL's perceptions of their tuition delivery role and whether this matched our students' perceptions of what constituted good tuition.

Methodology

Phase 1

Recordings of OU live tutorials across four level 2, health science modules were observed using a tutorial checklist (appendix y). The tutorial checklist contained a blend of semi-quantitative criteria for scoring, and qualitative free text comment boxes. The checklist was devised to assess the presentation style of the tutor, the pedagogic content of the tutorial and the OU Live tools used by the tutor to promote interactivity and student engagement within the tutorial. The checklist was tested in a pilot phase with all researchers scoring the same 5 tutorial recordings to ensure the checklist covered all relevant aspects required and the researchers were scoring the criteria in a consistent manner.

A total of 74 tutorials recordings were scored using the checklist across the four modules; S294 (n = 20 observations), S295 (n = 16 observations), SXHL288 (n = 18 observations) and SK277 (n = 20 observations).

The semi-quantitative data was analysed in Excel.

Phase 2

Students on all four target modules were invited to participate in an online survey. The survey consisted of a combination of closed questions, with responses graded on a Likert scale where appropriate, the results of which formed Phase 1 of this study. To provide an opportunity for students to elaborate upon their responses to the closed questions, a number of open questions were included and these were analysed using NVivo 11, as part of Phase 3. All closed questions are included in the Appendix.

Phase 3

Of the 29 students responding to the survey, 3 individuals were followed up with a semi-structured interview. Subsequently a further two students were identified (who had undertaken one or more of our target modules) and were interviewed.

ISBN 978-615-5511-25-7

The interviews sought to further explore students' perceptions and attitudes towards the synchronous, online tuition they had received. Our interview sample consisted of 2 women and 3 men, with one of the women based overseas in a different time zone.

In addition, 6 Associate Lecturers (5 women and 1 man) drawn from cohort of ALs tutoring the level 2 modules under examination, were interviewed with an analogous set of interview questions.

All interviews were transcribed and together with the text from the open-ended questions within the survey were coded in NVivo 11.

Findings Phase 1

From our observations we have a number of important findings. Our key Phase 1 finding is highlighted in Figure 1.

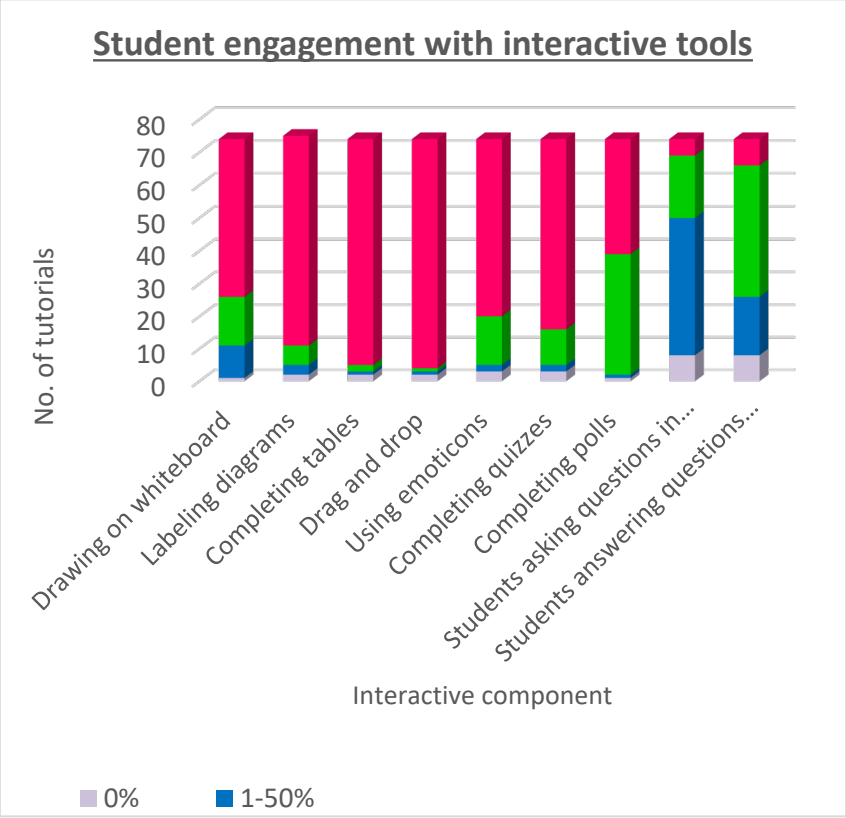


Figure 1. Graph to show use of interactive tools during tutorials

Figure 1 shows that in all tutorials a wide range of interactive tools were available but infrequently used by the tutor (pink bars). When offered use of the interactive tools, the majority of students engaged, as indicated by the green bars. In particular students favoured use of interactive tools that offered anonymity such as polling and drawing on the whiteboard.

Findings Phase 2

We have a number of important findings here. One key Phase 2 finding is highlighted in Figure 2 which illustrates students' perceptions of valuable aspects of tutorials.

ISBN 978-615-5511-25-7

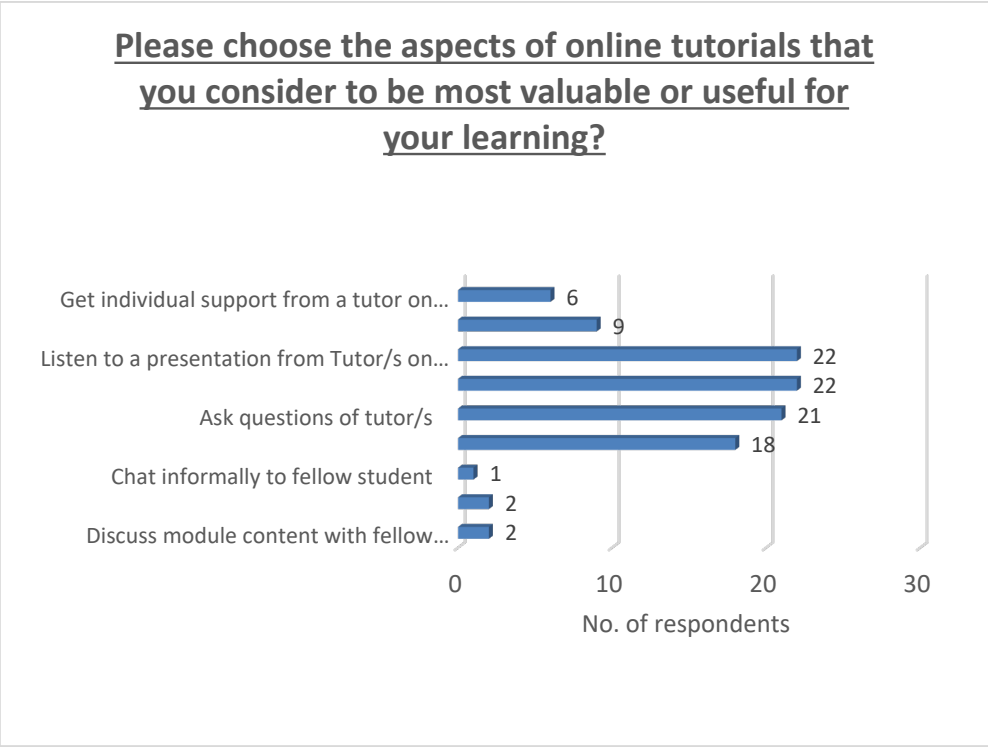


Figure 2. Graph to show student responses to survey question "Please choose aspects of online tutorials you consider to be the most valuable for your learning"

Figure 2 shows that students value listening to a tutor led presentation, the opportunity to check their understanding and the opportunity to ask questions of their tutor. Discussion (whether formal or informal) and activities with other students are not highly valued.

Findings Phase 3

The open ended survey data and the semi-structured interviews provided a wealth of data from students and ALs.

Most students surveyed or interviewed were very clear on the value of recording tutorials, for reasons of convenience but also to supplement revision and examination preparation. ALs however felt very strongly that the act of recording a tutorial negatively impacts on students' willingness to engage actively in the tutorial, particularly manifest in a reluctance to use the microphone to speak.

> *"they will be chatting away quite nicely and then as soon as we start recording everything goes into the chatbox"*

For the students interviewed this change in student behaviour within the tutorial was not seen as an important consideration given that the value of the recording to the students outweighed any negative effects experienced during the session.

The student view of interactivity with an online tutorial presented some interesting contrasts with that of ALs. The students reported that the tutorials they attended had been quite interactive and mentioned their tutors using polling questions and encouraged them to ask

ISBN 978-615-5511-25-7

and answer questions via the chat box but several did refer to their sessions as 'lectures', for example

> *"There are sections of it which are interactive but it does feel more like this is a lecture, you need to pay serious attention and take notes."*

Other students commented that the interaction could be stilted and one way, for example

> *"I didn't get involved…….The tutor would try really hard on every module, you know, to put a tick or draw a line on screen, or something like that. Hardly anyone would do it."*

Tutors felt they were doing as much as they could, within the online environment, to make sessions more interactive but they were aware of limited success and felt under pressure, albeit reluctantly, to deliver a content focussed session, perhaps feeling that this is what was expected and valued by the students, for example,

> *"I think students want to sit back and be taught and learn by listening without realising that they need to be interacting and thinking."*

All students questioned were aware that hearing students' voices within a tutorial was a rare occurrence and several commented that they had experienced use of break out rooms but only very rarely, for example

> *"The chat freezes in breakout rooms, I really don't like them."*

Tutors expressed similarly misgivings about use of breakout rooms, expressing frustration that students do not value group work and therefore will not engage in breakout rooms. They also expressed views around poor student attendance, stressing that low attendance make planning meaningful group work doubly difficult. Students, too were concerned about attendance, for example,

> *"Tutorials were only 3 or 4 people attended were thin and undynamic (sic)."*

Interestingly some student voices were asking for more student centred tutorials. Comments such as

> *"I would prefer tutorials to be a discussion between myself, the tutor and other students about current parts of the module"*

were rare, with most students valuing a good presentation of module content above anything else.

Conclusions

It is apparent from this detailed examination of the tutorials in Life and Health Sciences that, for the most part online tuition is not student centred. Online tutorials, regardless of scale in

ISBN 978-615-5511-25-7

terms of number of student participants, are largely didactic events and can be characterised as interactive lectures, with a limited use of the largely anonymous tools within the online room (polling and quizzing). This contrasts starkly with the view of ALs surveyed here, suggesting that they would prefer to facilitate sessions where students were much more active as learners and which they feel would be of greater benefit to their students. Interestingly we found student satisfaction with tutorial provision is high, although uptake is poor. This may suggest a mismatch between the expectations of the institution, its ALs and its students on the purposes of synchronous tuition and the learning benefits participation may bring. Indeed, our study illustrates a clear relationship between what our students suggest they value from tuition (a clear presentation of module content) with the type of tutorial that is ultimately delivered by their tutor – this suggest that student behaviour and the limited amount of student engagement within the tutorial is driving, to a large extent, the tutors' teaching style, with ALs retreating to a minimally interactive delivery style which is tolerated by the students.

There is a real focus in sessions on *coverage* with ALs striving to transmit information in well digested chunks on every aspect of the module content and the assessment. Furthermore, tutors report they are often distracted by the need to provide a coherent recording of the session. This, despite the fact, that the student is already in possession of expensively and expertly crafted distance-learning materials covering the same topics.

Communication is most likely to be via the chat box allowing students to answer and ask questions and only in a very few cases is there even any assumption that students will speak. Opportunities for group work are rare. In addition, perceived and real student reluctance is a factor here, with tutors fearful of 'forcing' students to participate in the online setting.

Extensive student use of recordings of sessions has shown us that there is an appetite for purely passive consumption of lecture type material which many students value. Should we be worried that most of our students are passive consumers of tutorials and what about the students who are looking for more from tutorials but who are disappointed?

Our detailed focus on the realities of tutorial provision in this area of our curriculum therefore suggests a new approach to tutorial provision in the UKOU setting is required; one which offers a greater variety of diversity of tutorial experiences in order to better match the variety of expectations of our students.

References

1. Conole, G., Dyke, M., Oliver, M., & Seale, J. (2004). Mapping pedagogy and tools for effective learning design. *Computers & Education, 43*(1-2), 17–33.

ISBN 978-615-5511-25-7

Towards Personalized Guidance and Support for Learning
Proceedings of the 10th European Distance and E-Learning Network Research Workshop, 2018
Barcelona, 24-26 October, 2018
ISBN 978-615-5511-25-7

HOW SCIENCE UNIVERSITY STUDENTS USE THE VIDEO IN THEIR LEARNING PROCESS?

Victor García, Antoni Pérez-Navarro, Jordi Conesa, Universitat Oberta de Catalunya, Spain

Summary

Science disciplines require a high capacity for abstraction and the ability to apply knowledge for solving problems in different scenarios, making these subjects specially challenging for many students and even worse in online environments. In such scenarios, educational video has proven to be an adequate resource for the effective transmission of scientific knowledge. However, once a video has been created, it is difficult tuning videos to fit the necessities of every single student, as a teacher could do in a face to face classroom. Videos can be recorded again after getting students feedback, but it is very hard work. A better approach would be to create videos as tuned as possible to the students, but that requires to know in advance what are the students' preferences and how they learn with videos. In this work we embedded a script in the web platform where the educational videos are provided to allow monitoring students' interactions with the course educational videos (e.g., clicking the play, stop or pause buttons in the video player). The data generated by the script have been analysed to study the way students of Physics at the UOC use the educational videos in their learning process for several semesters and therefore to propose how to better fit students' needs and problems in this resource. In addition, opinion questionnaires were analysed to contrast the results risen through the monitoring, and therefore to evaluate the perception of the students regarding the experimental data.

Introduction

Nowadays, educational videos are a usual media for learners that want to acquire and/or assimilate a concrete knowledge or skill. A big percentage of teachers indicate that they introduce the video to improve the learning experience and the students report some kind of use or video creation in their learning process (Kaltura, 2015). As the use of educational videos is increasing, data indicate that students spend a big quantity of time watching videos during their courses, especially in on-line environments (Lichter, 2012).

There is a wide variety of educational videos, from the pedagogical perspective (learning aims, teaching and exposition methodology, didactic approaches, editing typology…etc.); and from the technological perspective. Thus, videos can be classified following both points of view, as follows:

- From the pedagogical point of view:

  - *Lecture videos:* Normally focused in transmitting conceptual knowledge (Bethany & Wagner, 1999).
  - *How-to videos*: Normally focused in transmitting procedural knowledge, which normally include some sequential steps to solve a problem or explain how an activity happens in a particular way (Bethany & Wagner, 1999; Hiebert & Lefevre,1986).

- From the technology point of view:
  - *Livescribe® technology*: created through Livescribe®, that is a ballpoint pen capable of recording the strokes that the teacher makes with the pen and what the teacher is saying while writing.
  - *Digitizing tablets:* created through a digitizing tablet, while the writing and voice of the teacher is recorded. A Wacom® tablet has been used.
  - *Camera videos:* recorded thorough a video camera or a mobile while the teacher is giving the lesson.

The pedagogical perspective, as it is understood in the present paper, is often conditioned by the contents or the competences that the video tries to teach; and the technological perspective is often conditioned by the technology available to the teacher. However, are all the videos equally useful to students? Do students behave in the same way in front of different kind of videos? Some studies point out the benefits to study how the students watch educational videos (Kim et al., 2014; Xue et al., 2015), since monitoring, the interactions of the students with the videos can provide very useful information to improve their educational experience (Kleftodimos & Evangelidis, 2014).

The present paper analyses the behaviour of students of Physics at UOC, regarding different kinds of videos from the pedagogical perspective, and of the same technological kind. The paper is structured as follows: (a) Methodology: where the experiment carried out in this work is explained, (b) Results: where the data and results achieved from the experiments are shown, (c) Conclusions: where the main conclusions from the results achieved are discussed, and (d) Future researches: where the next steps in this research are defined.

Methodology

The methodology followed is experimentation. The experiment was performed in several steps:

1. A single teacher created around fifty videos. Since all the videos have been created by the same teacher, the teacher will not be a variable to consider. The teacher has also tested the three technologies for creating videos (Livescribe, digitized table, and camera recording) to find those with which feels more comfortable, in order to maximize the quality of the output. The videos followed the same notation and structure than written docent materials that students have available.
2. The items to be recorded in order to analyse the interaction between students and the videos were defined.

ISBN 978-615-5511-25-7

3. A script was developed to be included in the webpage where the videos are available for students. This script allows tracking and recording the interaction of students with the available videos by recording the items defined in the previous step.
4. All the videos were available to students during the semester and students were encouraged to watch them. Videos followed the same structure and order than written materials.
5. After the semester:
   Data recorded was analysed, and students were asked about their opinion and feelings about the videos and about how they interact with them. Two approximations were taken: a quantitative approach, through a survey, and a qualitative approach, through personal interviews.
6. Data recorded from the interaction was compared with data taken from the survey and the interviews to analyse the coherence between the three sources.

The experiment was carried out during two semesters of 2016 in the subjects of physics from different degrees in an on-line environment (UOC). The sample are 200 students every semester.

Results

In this section, results from the three sources of data are analysed: survey, interviews and interaction recorded data.

Survey

The survey has been designed to analyse the perception that students have regarding the role that videos play in acquiring the competences of the subject. The questionnaire was focused in two variables: (a) the usefulness of the videos perceived by the students regarding other educational resources (written documents, forums or any other), and (b) the impact perceived by the students in their learning process. 51 students of the sample completed the two multi-choice questions for these two variables.

Figure 1 shows the students' perception of usefulness regarding different educational resources. As can be seen, videos are perceived as a useful resource, although written materials are considered nearly as important as videos.

Figure 1. Educational resources considered most useful

ISBN 978-615-5511-25-7

Figure 2 shows more specifically how videos are perceived. As can be seen, students see them mainly as a complement (nearly 70%), and less than 30% think that they should be the main resource. This result agrees with the one found in Figure 1, since most of students find documents as important as videos. These two first questions allowed to see that actually videos play a key role in the subject of physics.

In order to check the perception from students with the data recorded, students are asked several questions about how they interact with the videos:

- About the way they behave when watching videos, as can be seen in Figure 3, students feel that they normally interact with the videos rather than watching them sequentially.
- About their preferred period to watch videos, as can be seen in Figure 4, students claim that videos are mainly used during the realization of the corresponding module homework, after reading the lesson, and before the exams.

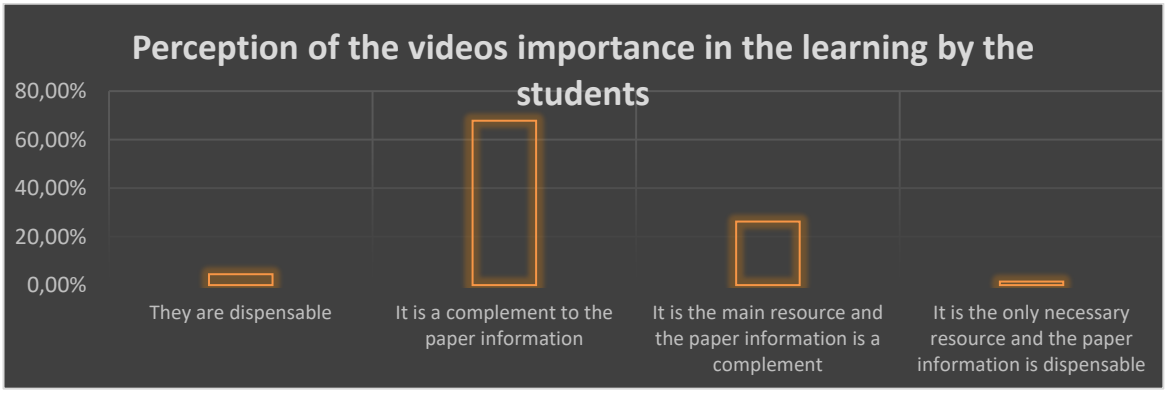


Figure 2. Perception of the videos importance in the learning by the students

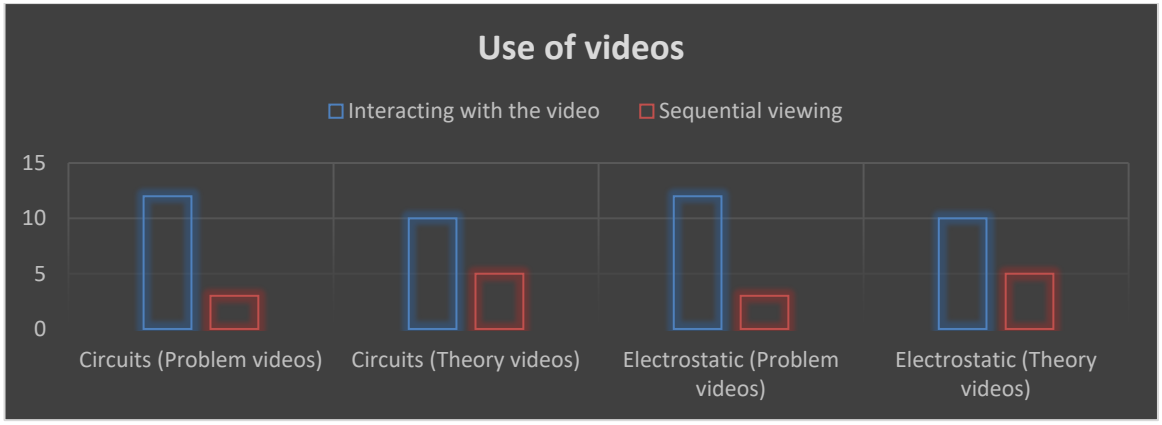


Figure 3. Graph indicating the type of use of the educational videos by the students

ISBN 978-615-5511-25-7

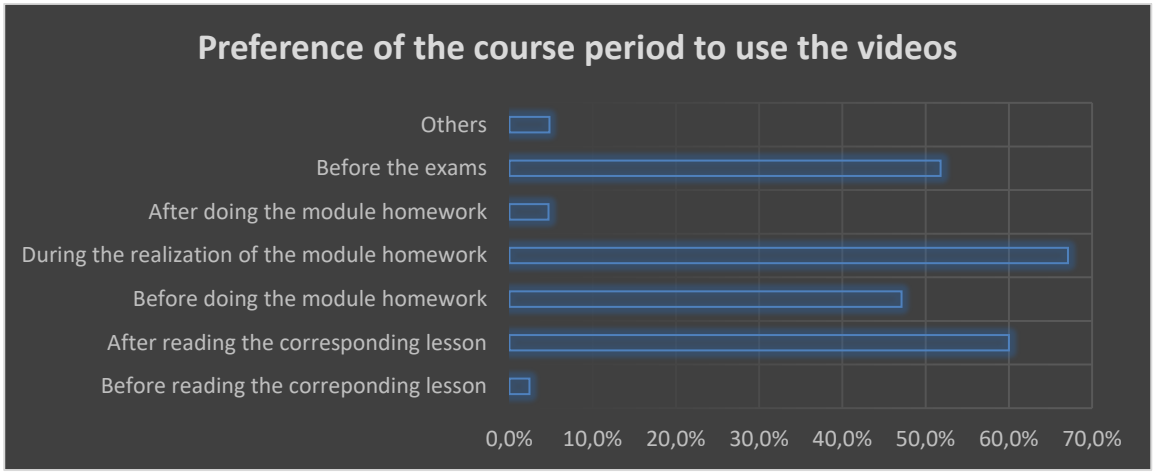


Figure 4. Preference of the course period to use the videos

Interviews

In order to increase the data and clarify some points of the questionnaire results, four students were interviewed. Table 1 summarizes the interview results, focused on the way they used the educational videos during the lessons.

Table 1: Results achieved on the interview regarding the next variable: students' perception of the videos in their education

Question	Ways of use of educational videos
Student 1	This student prefers to watch the videos in sequential way the first time, and then uses the interaction buttons to jump some parts or to stop and takes notes. Although if there is some concept difficult to understand stops and reviews this part.
Student 2	Indicates that the first time try to watch the videos in sequential way, but the second time goes to specific parts to review some particular concepts. This student prefers to watch the videos during performing the homework and before taking the exams.
Student 3	This student says that normally interact with videos from the beginning due to the necessity of reviewing concepts no understood before completing the educational video. The videos are preferable viewed during the exams period.
Student 4	This student prefers using the videos after reading the written material, but use it as a complement. The student prefers problem videos than theory videos since the student goes step by step in the process of applying the theory.

As can be seen, the interviews are in agreement with the results of the survey: students watch the videos when they are studying the subject; and although that can watch the video sequentially, they can also interact with it.

It is interesting to see the tracking of the course period when the students are watching the videos, Figures 5 and 6 show those data collected in two sequential semesters for the subjects: Electrostatic and Circuits. As can be seen, for the 1st and 2nd semesters the peaks show that the students watch the videos preferably in the middle of the course and before the exams, as some of them pointed out during the interviews.

ISBN 978-615-5511-25-7

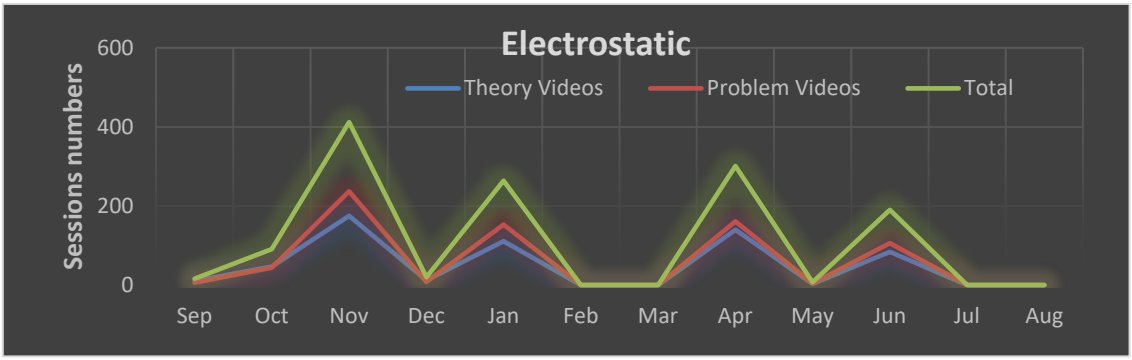


Figure 5. Number of video sessions started by the students during the two semesters for the Electrostatic subject

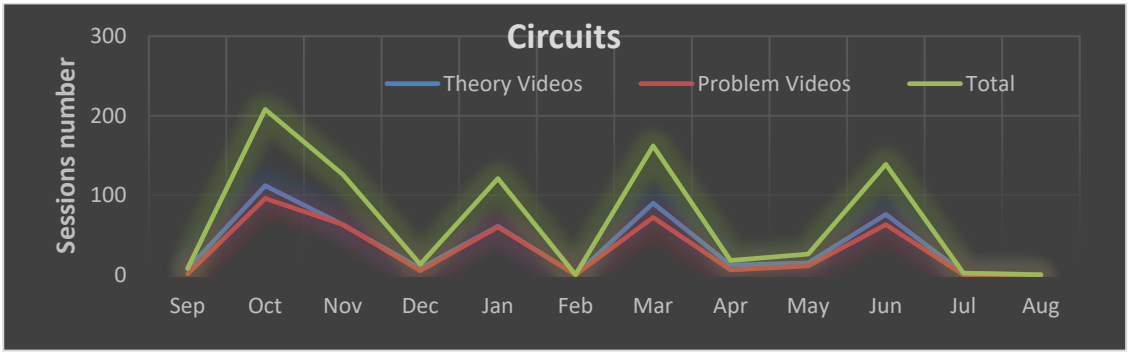


Figure 6. Number of video sessions started by the students during the two semesters for the Electrostatic subject

Data recorded

To analyse the behaviour of students with the video, 8 different types of interactions were recorded:

1. Sequential viewings: The video was watched without any interaction from the student.
2. Backward jumps: The students only jump backward during the video reproduction.
3. Backward jumps + pause-resume actions: The students jump backward and paused-resumed the videos.
4. Pause-resume actions: The students just paused and played the video reproduction.
5. Forward jumps: The students only jump forward when watching the video.
6. Backward jumps + forward jumps: The students only jump forward and backward when watching the video.
7. Backward jumps + forward jumps + pause-resume actions: The students use all the reproduction buttons when watching the videos.
8. Forward jumps + pause-resume actions: The students only jump forward and pause-resume the video.

In Figures 7 and 8, the representation of these interactions is shown for the Theory and Problem videos. Results from different parts of the subject (electrostatics and circuits) are also shown in different figures, to see if the kind of content can affect students' behaviour. In

ISBN 978-615-5511-25-7

addition, in these figures the results achieved in paper (Kleftodimos & Evangelidis, 2014) are represented for comparison reasons. In this study (Kleftodimos & Evangelidis, 2014) the authors monitored the interaction of the students with the videos for the subjects: "Introduction to Computers" and "Communication Technologies" taught at the department of Digital Media and Communication at the Technological Education Institute of Western Macedonia.

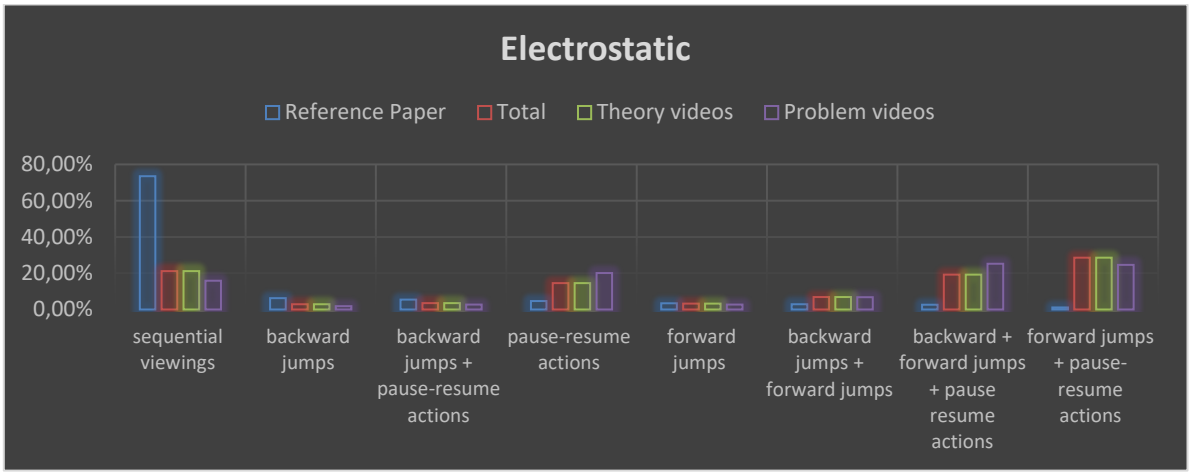


Figure 7. Students' interactions with the videos for the electrostatic subject

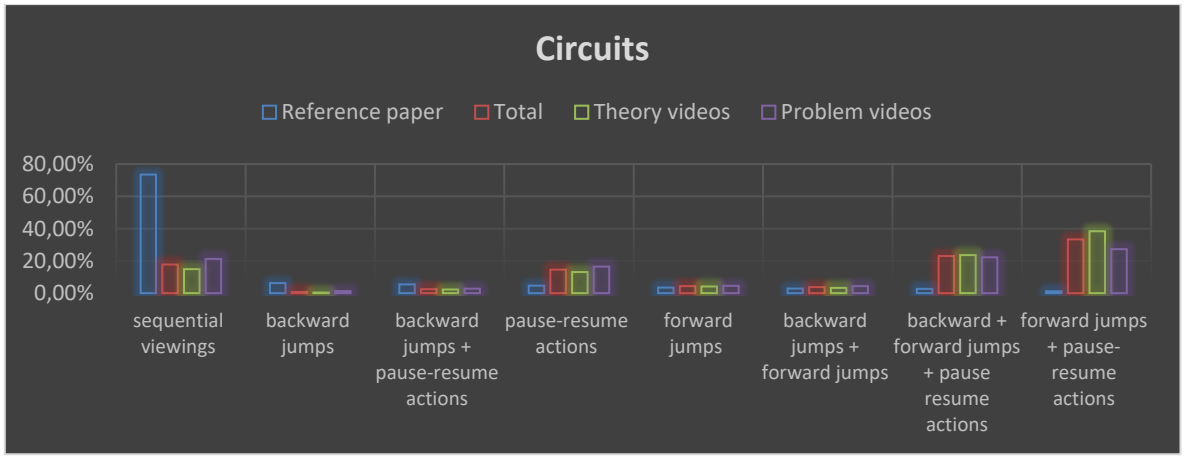


Figure 8. Students' interactions with the videos for the Circuits subject

As can be seen, in the students interact much more with the videos than in the reference study (Kleftodimos & Evangelidis, 2014). Students pointed out that they interact and review the understood concepts when watching the videos. An explanation for these differences may be that Physics subjects is a particular difficult knowledge that requires reviewing relevant concepts. This assumption is in line with Figure 4, which shows that the students feel that they need to interact with the videos to review studied material and understand difficult concepts.

It is interesting to see in these two previous figures, that students usually used almost all the interaction buttons during watching the videos. This high interaction with videos could indicate a lack of previous understanding from the students the first time they see the videos and thus, they need to stop and review the parts where the concepts they find difficult to understand are shown. So agrees with the kind of knowledge taught, which require a high

ISBN 978-615-5511-25-7

capacity of abstraction. However, it could indicate also that students use the videos as a consulting resources to review and better assimilate the information provided on paper. In further work, by tracking the number of interactions regarding the reproduction time it would be possible to see in which part of the videos these interactions are concentrated and therefore to know what concepts are difficult and need further study.

Conclusions

- Analysing the student activity on educational videos is quite important to examine viewer behaviour, since provide a more accurate information than only using questionnaires or interviews.
- The students need a higher interaction with the videos as the difficulty of the subject taught increases.
- Non-sequential viewing is the main pattern observed for the subject studied, mainly for reviewing.
- The students mainly use the videos for doing the homework, and for reviewing concepts before the exams.

Future researches

- To widen the study to add students from different environments: face-to-face and online educations and different subjects of science.
- To find out the parts of the videos where the students need to stop or review concepts.
- To use the feedback from the data collected to detect opportunity for improving the educational videos reducing the capacity of abstraction needed to understand the most difficult concepts.

References

1. Bethany R. J., & Wagner M. A. (1999). Conceptual and procedural knowledge of mathematics: Does one lead to the other? *Journal of educational psychology, 91*(1), 175.
2. Hiebert J., & Lefevre P. (1986). *Conceptual and procedural knowledge in mathematics: An introductory analysis.*
3. Kaltura Inc. (2015). *The state of video in education. A kaltura report.* ACM Trans. Comput.-Hum. Interact.
4. Kim J., Guo P.J., Seaton D.T., Mitros P., Gajos K. Z., & Miller R. C. (2014). Understanding in-video dropouts and interaction peaks in online lecture videos. *Proceedings of the first ACM conference on Learning @ scale conference (L@S '14). ACM, New York, NY, USA*, 31-40. doi=10.1145/2556325.2566237
5. Kleftodimos A., & Evangelidis G. (2014). Exploring student viewing behaviors in online educational videos. *Proc. IEEE 14th Int. Conf. Adv. Learning Technol., Jul. 2014*, 367–369.
6. Lichter, J. (2012). Using YouTube as a Platform for Teaching and Learning Solubility Rules. *Journal of Chemical Education, 89*(9). doi:10.1021/ed200531j

ISBN 978-615-5511-25-7

7. Xue N., He H., Liu J., Zheng Q., Ma T., Ruan J., & Dong B. (2015). Probabilistic modeling towards understanding the power law distribution of video viewing behavior in large-scale e-learning. *Proc. IEEE Trustcom/BigDataSE/ISPA, vol. 2., Aug. 2015*, 136-142.

Acknowledgments

This work has been partially supported by the European Commission through the project "colMOOC: Integrating Conversational Agents and Learning Analytics in MOOCs" (588438-EPP-1-2017-1-EL-EPPKA2-KA).

ISBN 978-615-5511-25-7

Towards Personalized Guidance and Support for Learning
Proceedings of the 10th European Distance and E-Learning Network Research Workshop, 2018
Barcelona, 24-26 October, 2018
ISBN 978-615-5511-25-7

WIKI COURSE BUILDER, A SYSTEM FOR MANAGING AND SHARING DIDACTIC MATERIAL AND CONCEPT MAPS

Carlo De Medio, Carla Limongelli, Fabio Gasparetti, Filippo Sciarrone, Roma Tre University, Giovanni Adorni, Frosina Koceva, Ilaria Torre, Genoa University, Italy

Summary

In this article we present an evolution of Wiki course Builder, a system for building courses, sharing and sequencing learning material taken from Wikipedia pages. The system has been expanded through the implementation of two new modules to provide teachers with different tools that optimize the course creation process. Taking advantage of the user model implemented in the system starting from Grasha's teaching styles, we have implemented a module that visualizes the graph of all the courses created by the teaching community and makes it possible to compare it with others. This graph can be filtered by macro categories of arguments (e.g. History, Philosophy...) and by teacher archetypes (e.g. expertize delegator ...). The second module is a graphical interface that makes it possible to design and build concept maps for the generation of different courses (alternative learning paths through the map). The comparison between these maps will enrich the model of the teacher who will receive recommendations more refined on the basis of the course method you prefer to make. For the future it will be interesting to extend the user model through the comparison of the concept maps generated by the creation of the course and the clustering of the teachers on the basis of this data. Furthermore, the study of the density of concepts within the materials and the complexity of learning difficulties would complete the user model by optimizing again the recommendation process.

Introduction

Over the years, the growth of the online repositories of educational and systems based on their use has grown exponentially. The web is now the largest source of knowledge, but also a source of unverified information. Moreover, online information is difficult to find due to the multitude of labelling systems used by the various online repositories that forces teachers to do multiple searches, allowing only in a few cases to use the past experience of other teachers. One of the biggest knowledge bases is undoubtedly Wikipedia, where most of the educational articles are written by domain experts as discussed by Mesgari et al. (2015). The proposed system is an extension of Wiki Course Builder, an online platform for the creation of online courses already presented by Gasparetti et al. (2016). The extension implements two new functions designed to encourage the development of shared knowledge among teachers in order to improve the quality of the courses provided. Specifically, from the user model created starting from the Teaching Styles of Grasha (1996) and from the results proposed in the

analysis of the system reported by Gasparetti et al. (2015) a community graph based on archetypes is presented. Each course that the teacher will configure on the platform will enrich the graph, which can be explored, navigated and filtered to see what the other teachers with similar user models have done before. The extension also introduces a panel for the creation of concept maps for each topic created in *point and click* mode. To this aim we use ENCODE (Adorni & Koceva, 2016), a tool that supports teachers in the instructional design process of a course. The underlying idea of the tool is that the separation of the knowledge structure of a subject matter from its information resources serves two goals: making the knowledge structure re-usable with different information resources and allowing different learning paths through the same knowledge structure.

Furthermore, by resuming the work (Gasparetti et al., 2015) on the recognition of the prerequisites, it was possible to insert suggestions for the maps created, highlighting in red the arcs that probably reflect a prerequisite / successor relationship.

Related Work

A relevant problem in subject matter representation is that there is no canonical representation of knowledge structures, since different structures can satisfy the same learning goal as well as different structures can represent different perspectives over the same subject. This principle has been defined by Ohlsson (1987) as the "Principle of Non-Equifinality of Learning", according to which the process of acquiring a particular subject matter does not converge on a particular well-defined representation of that subject of study. Hence, the process of acquiring the subject matter have many different, equally valid, end states.

According to this, the approach presented in this paper does not aim to build the optimal concept map for a given subject matter: its aim is to support the teacher to build a map that takes into account the perspective of other teachers and the knowledge structure of a large community-based encyclopaedia, Wikipedia.

Wikipedia offers a quantity of high-quality content homogeneous in terms of presentation (Mesgari et al., 2015). The openness, easy availability, and freshness of data make Wikipedia of interest in a variety of research activities, such as natural language processing and translation tools. Links, categories and information in templates provide structured content that can be retrieved from raw XML dumps or Application Program Interface calls.

Wikipedia had its peak of contributions in 2007, however, even with the advent of other alternatives, such as Google's Knowledge Graphs Project (launched in 2012) that may be gobbling up Wikipedia users, it remains one of the most used source of information. Moreover, although user accesses have fallen on average by 10 in 2013, it is a matter of fact that most of the teachers, about 87% (Purcell et al., 2013), use the online Wikipedia encyclopaedia in their didactic activities. The reliability of Wikipedia (primarily of the English-language edition) has been also assessed: an early study in Nature journal said that in 2005, Wikipedia's scientific articles came close to the level of accuracy of the Encyclopaedia Britannica (Giles, 2005).

ISBN 978-615-5511-25-7

As already described in previous works (Gasparetti et al., 2016; Grasha, 1996), the proposed system is quite innovative. With respect to the two proposed extensions, we see that in the literature there are some attempts to incorporate selected Wikipedia content into the curriculum as a collaborative environment (Forte & Bruckman, 2006) or to categorize learning resources (Meyer et al., 2007). In any case, we have not found any system that guides and helps teachers to build and share didactic learning paths, by exploiting Wikipedia.

The System

In this section, we present the architecture of the system with a focus on the features introduced in the extension. In this system each course is created by multiple topics, which are composed by one or more pages taken from Wikipedia. The system architecture is presented in Figure 1 Initially, the teacher must compile the registration form and a questionnaire in order to be profiled. With this data the *Authentications Manager* module initialize the user model. Then the teacher can start creating his first course by entering his first search query; the *Query Terms Manager* will take care of the query expansion that will be processed by the *Search Engine*. This module, using a local version of Wikipedia updated periodically on no-SQL DB (MongoDB), performs a search to find the initial concept from which to start building the course. The *Recommendations* module will be used to calculate the metrics presented by Gasparetti et al. (2015) used to create the Wikipedia graph from which the recommendations will be made for users. Finally, using the classifier for the prediction of the prerequisites / successors, a sequencing from the *sequencing* module will be presented. The courses are stored by the *Page Manager*.

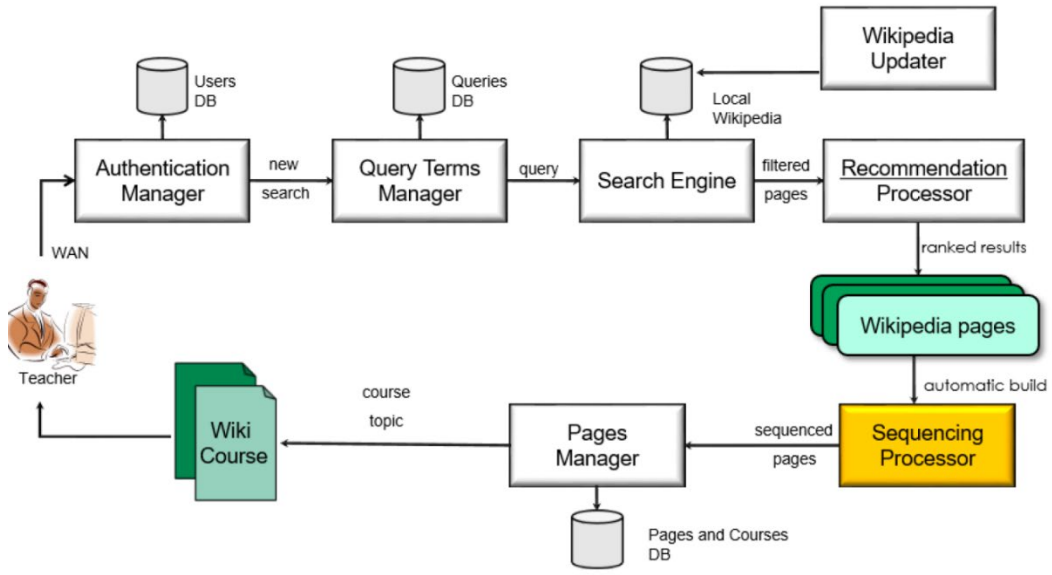


Figure 1. The System Architecture

ISBN 978-615-5511-25-7

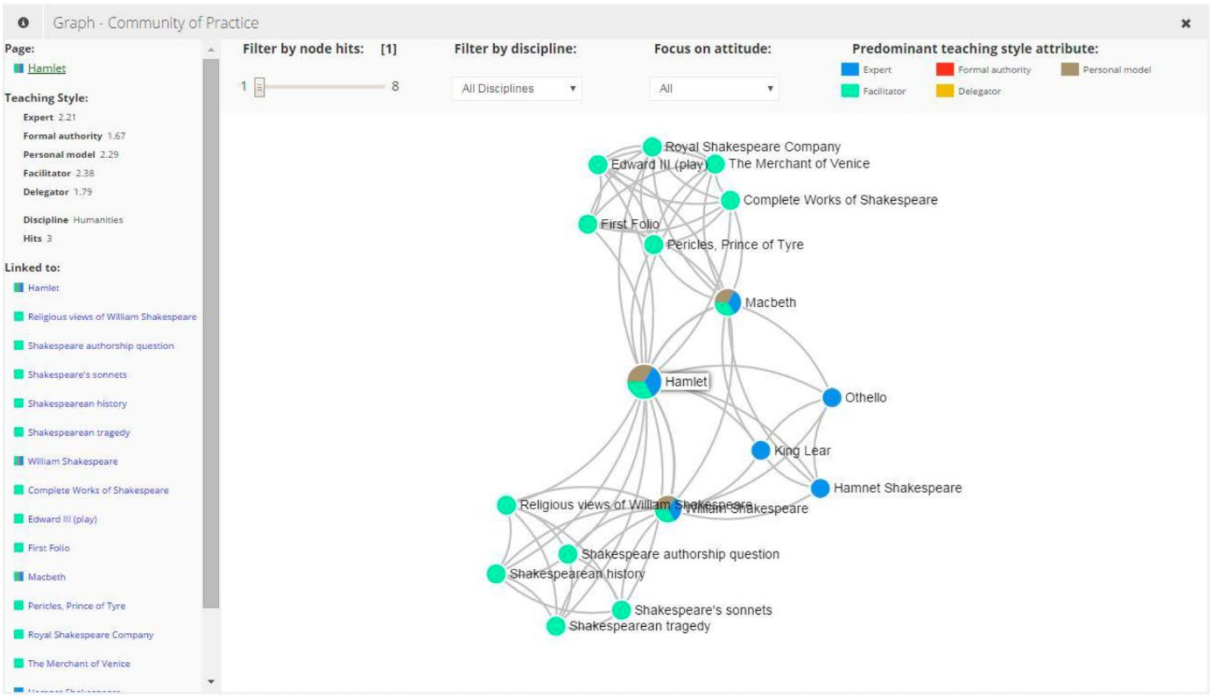


Figure 2. Focus on a course on the community graph

The first function implemented in the extension is the Community graph. The graph is available in the community section from the main menu and shows all the courses developed by the teachers on the platform. Moreover, for each course, the system reports all the topic's relationships to each other. The teacher will then be able to look for courses related to the one he wants to create and before starting the construction he can look at how the community has dealt with the same topics before him. Finally, the teachers can filter the graph looking only for the courses of the teachers most related to him, or those with teaching style closer to his. An example of how a specific section of the graph appears is presented in Figure 2. In the future the analysis of the relationships of this graph will expand the user model by an analysis between similarities between graphs of similar teachers.

Tool for Concept Map Design

The most important function integrated in this extension is the graphical tool for the creation of concept maps ENCODE (Adorni & Koceva, 2016). Once the materials have been selected for the topic, the teacher has the possibility, using a *point-and-click* panel, to manually enter the relationships between them. The result will be an acyclic graph that can be exported. The tool communicates with the prerequisite / successor relations recognizer; for each relationship created the tool will make a call to the classifier that can label the arc in the following ways:

- green agrees with the teacher,
- red discord with the teacher,
- grey not expressed.

Based on the labels the teacher can review the graph and, if needed, modify it. Finally, the reports saved in these graphs will be analysed for future recommendations of materials.

ISBN 978-615-5511-25-7

ENCODE

The tool is based on the conceptual model of the Educational Concept Maps. An ECM is a logical and abstract annotation model that represents the concepts of a subject of study, their educational relationships and the learning outcomes. It has been designed by taking into account the pedagogical requirements defined by the Educational Modelling Language research group (Koper & Manderveld, 2004).

The relationships modelled in the ECM are the following: prerequisite relation (is_requirement); hierarchy and aggregation relation (is_item); correlation (is_related); association with a concept that can be suggested to go into more detail on the matter (is_suggested). Among these relationships, the most relevant from the instructional design point of view is the prerequisite relation. The prerequisite relation between two concepts A and B represents what a learner must know/study (concept A), before studying concept B. Thus, A is a propaedeutic concept, i.e. a requirement, for B and the learner should first understand A in order to understand B.

The main properties of the prerequisite relation are defined as follows:

- asymmetric and binary relation;
- anti-reflexive relation: concept A cannot be a prerequisite of itself;
- transitive relation: if concept A is prerequisite of B, and concept B is prerequisite of C, then concept A is also prerequisite of concept C.

The prerequisite relation can represent a hyponymy or meronymy relation in the case where the hyponym/meronym concept is going to be further in-depth studied and therefor it is itself a prerequisite to another concept. Conversely, the hyponymy/meronymy relation is represented by the is_item ECM relation.

The prerequisite relation represents the learning dependencies between the concepts and is the basis for the creation of learning paths through the map. A learning path is a linearization of the ECM that satisfies the prerequisite constraint and provides ordering (a sequence) of the concepts and thus of the content associated to them.

To implement the ECM model, ENCODE adopts the Topic Maps (TM) standard. TM is an ISO multi-part standard designed for encoding knowledge and connecting this encoded knowledge to relevant information resources (http://www.isotopicmaps.org). The standard defines a data model for representing knowledge structures and a specific XML-based interchange syntax, called XML Topic Maps (XTM).

The main elements in the TM paradigm are: *topic* (a symbol used to represent one, and only one, subject), *association* (a relationship between two or more topics) and *occurrence* (a relationship between a subject and an information resource). Therefore, two layers can be identified in the TMs paradigm:

- The knowledge layer representing topics and their relationships, forming a graph.

ISBN 978-615-5511-25-7

- The information layer describing information resources, to be attached to the ECM topics.

Each topic can feature with any number of names (and variants for each name) and any number of occurrences, and its association role, that is a representation of the involvement of a subject in a relationship represented by an association. All these features are statements and they have a scope representing the context a statement is valid in. Using scopes, it is possible to avoid ambiguity about topics; to provide different points of view on the same topic (for example, based on users' profile) and/or to modify each statement depending on users' language, etc. Therefore, to solve ambiguity issues, each subject, represented by a topic, is identified by a subject identifier. This unambiguous identification of subjects is also used in TMs to merge topics that, through these identifiers, are known to have the same subject (two topics with the same subject are replaced by a new topic that has the union of the characteristics of the two originals).

The current implementation of the tool is based on Wandora (https://github.com/wandora-team/wandora), a general-purpose information extraction, management, and publishing environment based on Topic Maps and Java.

Encode provides: a graphical visualization/navigation and editing interface which lets the map-designer to incrementally populate the concept map and the associated materials. In addition, the tool provides a utility to build a lesson plan as a linearization of the ECM (using a topological ordering algorithm) and utilities for the consistency checks. The tool allows to export both the ECM and the lesson plan in XML format. Finally, a utility enables the teacher to generate a simple web site of the lesson plan. Based on Wandora, ENCODE is a desktop application but a web-based version is under development. An example of Educational Concept Map is available (http://teldh.dibris.unige.it/ecm-example/).

Conclusions

WCB is a system that supports teachers through the entire course creation process. It models teachers following Grasha's teaching style and keeps track of all users' interactions to recommend materials taken from Wikipedia. The System labels pages with a 5-dimensional array that reflect the Teaching Style presented by Grasha; all this measures makes possible to explore and filter the community graph containing all the courses delivered by the platform, with the relationships between materials. Furthermore, the possibility to create and export concept maps has been added, as well as the course in various formats. For the future it will be very interesting to see how the study of the concept maps implemented by teachers can expand the user model, trying to integrate the work presented by Limongelli et al. (2017) on similarity between maps by analysing a set of features associated with them. This information would improve the page recommendation module and the usability of the courses.

References

1. Adorni, G., & Koceva, F. (2016). Educational concept maps for personalized learning path generation. *Proceedings of Conference of the Italian Association for Artificial Intelligence*, 135-148. LNCS, vol 10037, Springer, Cham.

ISBN 978-615-5511-25-7

2. Forte, A., & Bruckman, A. (2006). From Wikipedia to the classroom: exploring online publication and learning. *Proceedings of the 7th international conference on Learning sciences (ICLS '06). International Society of the Learning Sciences*,182-188.
3. Gasparetti, F., Limongelli, C., Milita, A., Sciarrone, F., & Tarantini, A. (2016, April). *Sequencing Wikipedia Pages: An On-the-fly Approach to Course Building.* Paper presented at the 8th International Conference on Computer Supported Education (CSEDU 2016), Rome, Italy.
4. Gasparetti, F., Limongelli, C., & Sciarrone, F. (2015, June). *Wiki course builder: a system for retrieving and sequencing didactic materials from wikipedia.* Paper presented at Information Technology Based Higher Education and Training (ITHET), Lisbon, Portugal.
5. Giles, J. (2005). Internet encyclopaedias go head to head. *Nature, 438*. dx.doi.org/10.1038/438900a
6. Grasha, A. F. (1996). *Teaching with style: A practical guide to enhancing learning by understanding teaching and learning styles.* Retrieved from http://departments.knox.edu/facdev/archives/POD_packets/Packet4/Teaching%20With%20Style.htm
7. Koper, R., & Manderveld, J. (2004). Educational modelling language: modelling reusable, interoperable, rich and personalised units of learning. *British journal of educational technology, 35*(5), 537-551.
8. Limongelli, C., Lombardi, M., Sciarrone, F., & Temperini, M. (2017, July). *A framework for comparing concept maps.* Paper presented at the 16th International Conference on Information Technology Based HigherEducation and Training, ITHET 2017. Ohrid, Macedonia.
9. Mesgari, M., Okoli, C., Mehdi, M., Nielsen, F. Å., & Lanamäki, A. (2015). The Sum of All Human Knowledge: A Systematic Review of Scholarly Research on the Content of Wikipedia. *J. Assn. Inf. Sci. Tec., 6*, 219-245. doi:10.1002/asi.23172
10. Meyer, M., Rensing, C., & Steinmetz, R. (2007). *Categorizing Learning Objects Based On Wikipedia as Substitute Corpus.* Paper presented at the First International Workshop on Learning Object Discovery & Exchange (LODE'07).
11. Ohlsson, S. (1987). Some principles of intelligent tutoring. *Artificial intelligence and education, 1*, 203-238.
12. Purcell, K., Heaps, A., Buchanan, J., & Friedrich, L. (2013). *How Teachers Are Using Technology at Home and in Their Classrooms.* Retrieved from http://www.pewinternet.org/2013/02/28/how-teachers-are-using-technology-at-home-and-in-their-classrooms/

ISBN 978-615-5511-25-7

Towards Personalized Guidance and Support for Learning
Proceedings of the 10th European Distance and E-Learning Network Research Workshop, 2018
Barcelona, 24-26 October, 2018
ISBN 978-615-5511-25-7

HOW DO YOU BUILD A BOLD RESEARCH CULTURE? INSIGHTS FROM THE NATIONAL INSTITUTE FOR DIGITAL LEARNING EXPERIENCE

Mark Brown, Gráinne Conole, Dublin City University, Ireland

Summary

This paper reflects on and offers insights into the challenge of building and fostering a strong culture of research and innovation in the area of blended, online and digital (BOLD) learning by drawing on the experience of the National Institute for Digital Learning (NIDL) at Dublin City University (DCU). It begins by outlining the importance of a strong research and innovation culture that engages with some of the big questions facing Higher Education in order to help steer a pathway through such rapidly changing and uncertain times. The development and associated activities of the NIDL are then described with a number of success factors identified and benchmarked against other international research centres. In briefly reporting lessons and examples from these centres the paper serves to illustrate some of the enabling conditions that are crucial to supporting teaching and learning transformations in the digital world. Finally, we conclude that strategically focussed and well networked research and development centres play an important role in building individual agency and institutional capacity to harness the BOLD opportunities available to 21st century educators.

The importance of a strong research culture

Higher Education is facing powerful change forces (Halloran & Friday, 2018). A recent book exploring what Higher Education will look like in 2040 illustrates how more than ever university leaders and policy-makers need to engage in futures thinking, especially if we wish to both set and steer our own transformative agenda (Davy et al., 2018). While the future is impossible to predict by embracing a transformative mission supported by an open and strong research culture, which fosters innovation in teaching and learning, then it may be possible to turn uncertainty into opportunity. One such opportunity is the disruptive impact that new digital technologies are predicted to have on the Higher Education landscape. Orr et al. (2018) demonstrate how around the globe new entrepreneurial models are beginning to challenge conventional modes of delivery and helping to extend access to Higher Education beyond traditional campus-based learners. OUA (2018) argues that the future of education will be influenced by four factors. Firstly, the changing nature of work and the fact that in the future it is likely that many people will have multiple careers. Therefore, there is a need to go beyond knowledge recall to helping learners develop higher-order skills such as critical thinking and problem solving and to enable them to be lifelong learners. Secondly, we are seeing a spectrum

of learners, from the demands of the "now generation" who want flexible and adaptive learning opportunities personalised to their individual needs through to those who are learning for leisure reasons rather than for work purposes. Thirdly, we are seeing the emergence of new forms of accreditation, such as digital badges, certificate of participation, micro-credentials, and blockchain technology (Martindale, 2018) to enable learners to document and record their learning across different contexts. Finally, we are seeing an unbundling of education (McCowan, 2017); in the future learners may choose to pay for components of learning such as: resources, support, guided learning pathways or accreditation. Importantly, as Brown (2017) argues, the unbundling movement is not on an independent trajectory and needs to be located in wider debates about our preferred education futures.

Similarly, any consideration of the future needs to think about how we would like new BOLD models of learning serve to create better education systems and more socially just societies—for all. Over the past 20 years an increasing range of educational technologies have evolved to offer a rich variety of ways in which learners can interact with content and tools to communicate and collaborate (Weller, 2018). Research exploring the use of BOLD models for education has rapidly expanded in recent years, focusing in particular on how digital technologies can be used across formal and informal learning contexts, the types of digital literacies teachers and learners need to be able to harness their technical and pedagogical affordances, and the impact of non-formal offerings such as Open Educational Resources (OER) and Massive Open Online Courses (MOOCs) on traditional educational settings. UOC (2018) provide a list of current research on the use of digital technologies for education (more specifically e-learning) based on an extensive analysis of over 800 recent articles. The topics include: mobile learning, assessment, MOOCs, virtual reality, e-learning adoption, games and gamification, platforms, course evaluations, tool evaluation, learning analytics, instructional design, adaptive learning, literacy, video, social media, intelligent systems, training, e-health, resources and blended learning. Therefore, it is evident that a raft of digital technologies will continue to have an increasing impact on Higher Education. However, the challenge from both a research and implementation perspective is to avoid a narrow techno-centric focus by recognising new digital technologies should be in the service of big ideas, not as the big idea in itself. This key point underscores the importance of promoting a future-focussed research culture that explores the big questions facing Higher Education in the digital-era.

In order to provide personalised guidance and support for learning, there is a need to focus on the crucial and changing roles of teachers in supporting student learning in the digital world. This includes the creation of enabling conditions that encourage learning personalisation, learner agency and self-direction. Teachers' and learners' roles are changing as a result of the increasing use of technologies; there is a need to rethink teaching facilitation strategies that harness the potential of technologies. Teachers' roles are shifting from one of delivery to facilitation, and they need to use technologies to foster communication, collaboration and reflection. Both teachers and learners need new digital literacy skills, and although learners are

ISBN 978-615-5511-25-7

technological savvy they don't necessarily know how to use technologies for academic purposes. They want personalised and flexible learning and need to harness the potential of being part of a connected global community of peers. In the future it is likely that learners will learn across a range of contexts, therefore they need to take control of evidencing their achievement of learning outcomes through e-portfolios or more radically through the use of blockchains. Furthermore, new approaches to design are needed to create pedagogically informed learning interventions that make appropriate use of digital technologies (Conole, 2013). Digital technologies and in particular social media are opening up education (dos Santos et al., 2016), to widen access and participation to everyone by removing barriers and making learning accessible, abundant, and customisable for all. It offers multiple ways of teaching and learning, building and sharing knowledge. It also provides a variety of access routes to formal and non-formal education. OER and MOOCs are challenging traditional educational offerings and providing students with ways of augmenting their formal education with free materials.

Overview of the NIDL and associated activities

The National Institute for Digital Learning (NIDL) aims to be a world leader at the forefront of designing, implementing and researching new blended, online and digital (BOLD) models of education. It has a mission of transforming lives and societies by exploring BOLD new models of education for a better and more sustainable future for all. The NIDL is committed to providing strategic leadership, building strong communities of innovation, and enabling and contributing to world-class research. It supports a comprehensive suite of professional development opportunities in BOLD education from workshops to advanced postgraduate and doctoral studies. In addition, the NIDL is committed to promoting access to university-level online degrees and qualifications through the DCU Connected initiative and through a suite of free online short courses through the FutureLearn platform. The NIDL was established in November 2013 and undertakes a range of learning, teaching and research activities exploring how technologies can be used to support digital learning. It consists of three units:

- the Teaching Enhancement Unit, whose focus is to support the design, development and evaluation of distinctive and transformative professional learning experiences for staff;
- the Open Education Unit, whose focus is to support the design, delivery and effective management of distinctive and transformative online learning experiences for distance students; and
- the Ideas Lab, whose focus is to support the design, development and research of new and emerging models of BOLD education with the potential to help transform lives and societies.

The NIDL has associated with it a set of core principles: glocal, access, inclusion, impactful, openness, enterprise, engagement, transformation, lifelong learning and distributed leadership. The NIDL team are involved in a range of courses on BOLD learning; from accredited modules to specialist postgraduate degrees and doctoral study. The Open

ISBN 978-615-5511-25-7

Education Unit is responsible for overseeing the DCU Connected platform and increasingly works with the faculties to develop quality online courses. The NIDL Ideas Lab is where learning and digital innovation seed, blossom and grow. Founded on the principles of design thinking, rapid prototyping and a learning-centred approach the Ideas Lab is focused on agility, on acceleration and the scaling of learning ideas into full-implementation. The Ideas Lab Team aims to bring about transformative learning whilst focusing on the digital horizon. Under the leadership of the Ideas Lab DCU has partnered with FutureLearn and has developed a series of MOOCS including several on Irish language and culture.

The development of NIDL's research culture

Research is core to the NIDL's mission and this section reports on efforts to establish and foster a strong research culture within and across the three units. During the establishment phase of the NIDL one of the initiatives to help embed futures thinking and research at the heart of organisational culture was creation of an International Advisory Board of leading scholars from around the globe (https://www.dcu.ie/nidl/people/advisory-board.shtml). Another key initiative was the formal appointment of the lead author as a visiting Professor to support research and act as mentor and critical friend to academic staff. Also in 2014 the NIDL funded Ireland's first Horizon Report for Higher Education in order to keep a strong futures focus and build links with other Irish educators. From the outset the aim was to build a wider community of interest in research across the DCU, with over 50 staff from faculties and service units, such as the Library, joining the Digital Learning Research Network. In the first two-years of operation monthly research hot topics were also open to DCU staff and regularly hosting visiting scholars with an international reputation for their research was a feature of the NIDL's activities.

In order to support a more focussed approach and collaborative working culture the NIDL anchored its research around DCU's four main platforms of a wider Research and Innovation Framework (Figure 1), which places a strong emphasis on fostering innovation and contributing to societal impact. More specially, anchored in this framework, five broad research strands were defined to encapsulate the NIDL's main research interests: (a) lifelong learning, (b) opening up education, (c) student transitions and success, (d) curriculum innovation and teaching enhancement, and (e) learning futures. A deliberate effort was also made to interface with and build positive relationships with other relevant research centres along with DCU's Institute of Education. In terms of the latter the NIDL recently funded several doctoral scholarships in partnership with Institute of Education and in 2016 co-hosted a National Digital Learning Research Symposium. A distributed leadership model was adopted to help build a research culture to harness the skills and interests of a wide range of people across the university.

ISBN 978-615-5511-25-7

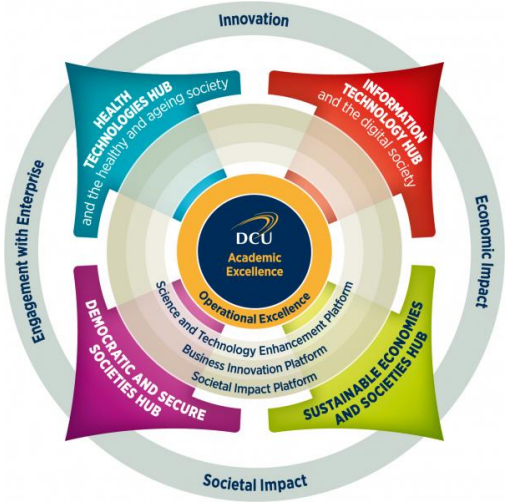


Figure 1. DCU's Research and Innovation Framework

Several other initiatives were crucial to supporting the goal of embedding research at the core of NIDL activities. Firstly, there was a deliberate effort to seek out and participate in externally funded projects with a research and development objective. In this respect NIDL research teams have contributed to more than a dozen national and international research projects, including several major European projects in the area of MOOCs and a collaborative study with Beijing Normal University. Furthermore, the NIDL has strategically engaged with major professional bodies in the area through taking on leadership roles and actively participating as an institutional member (e.g., ALT, EADTU & EDEN). In the case of the U.S. based Online Learning Consortium (OLC) in 2018 one of the NIDL's doctoral students was the recipient of an inaugural emerging scholars award. The NIDL has also hosted a number of international events since it was established and in 2019 will host the 28th ICDE World Conference on Online Learning. The number of scholarly outputs produced by members of the NIDL is also a measure of research activity, with almost 500 outputs since the start of 2014. While in the first few years the strategy was to use conference papers as a vehicle for networking and seeking feedback on research in progress more recently the focus has shifted to publishing in appropriate ranked journals. Having said that the NIDL is committed to supporting open access publications and for the last three years has undertaken an exercise to identity the top 10 open access journal articles published over the year. In 2019, the NIDL will partner with two other universities to take on a formal editorial role of a major international journal published by Springer in an open access format. This initiative is further evidence of how the NIDL continues to evolve to enhance the quality of research and scholarship.

Factors for success

The experience of developing the NIDL into a vibrant research institute provides valuable insights into some of the important factors for success in establishing and maintaining similar institutional research centres. Firstly, the foundation for success can be traced to strong leadership with the collective vision and commitment to developing the research capacity of staff and their ability to translate evidence-based findings into practice. In DCU's case the

ISBN 978-615-5511-25-7

support of the university's President was crucial to both the establishment and continued development of the NIDL. Secondly, the value of a Director who has good knowledge and is well networked internationally with strong links to other high-profile international researchers cannot be underestimated in contributing to the NIDL's success. Notably, the NIDL Director has adopted a philosophy of building more leaders than followers, which is evidenced by the number of jointly authored publications. Thirdly, the importance of building up a strong team of staff committed to addressing common problems and working together rather than as "lone ranger" researchers is a key ingredient. Fourthly, the need for appropriate structures with clearly articulated and distinct areas of responsibility but with soft boundaries helps to foster collaboration and develop research capacity. Fifthly, engagement with relevant international communities and professional bodies has helped to benchmark the NIDL and ensure that staff are part of a wider research network. Sixthly, complementing in-house activities with externally funded research projects and delivery of externally focussed conferences and workshops has helped validate the NIDL's work and build staff capability. Finally, active engagement with key faculty staff and timely hosting of face-to-face events along with strategic use of social media has helped to ensure research activities have an impact both within and beyond the institution.

Benchmarking the NIDL

The NIDL is a relative new comer in the spectrum of centres exploring the use of digital technologies for education. It is worth reflecting on the similarities and differences to more established centres. While Gaebel et al. (2014) claim that most European universities are involved in some form of e-learning their activities are often driven by individual academics or departments and a low percentage of institutions adopt a more coordinated or networked approach. In this regard Smith and Zanios (2014) provide a useful set of guidelines for universities on setting up e-learning centres. They argue that there is the need to learn about the know-how, best practices, and rules of thumb of implementing e-learning. Despite the progress that has been made in recent years in the general area of BOLD education, many institutes/organisations that wish to take a bigger step to more fully implement digital learning environments face the problem of not knowing where to start from, nor what to do. One of the challenges is that the use of new digital technologies is a field of rapid continuous development. For this reason, Bichsel (2013) suggests that institutions take a multi-pronged approach to developing services, infrastructure and related pedagogical supports to best fit the institutional context. While there is no single recipe to what works Smith and Zanios list a range of functions of centres focusing on the use of digital technologies in education:

- support of academic staff, by working with subject specialists to design and set in place the e-learning infrastructure for courses, modules or programmes of study;
- defining requirements for best e-learning practices and individualised e-learning approaches;
- provision of pedagogic and technical e-learning solutions, and production of new knowledge;

ISBN 978-615-5511-25-7

- helping universities to build next generation e-learning tools and services for its core residential and its extended education environment.

Figure 2 shows the stages associated with the establishment of a dedicated institutional research and development centre for promoting new BOLD models of education; from establishment, through to mature operation and finally evaluation. Following a hub and spoke model it shows how this type of central unit needs to relate to various elements of management, and to student learning, staff development, and learning resource development. Beetham et al. (2001) state that educational technology staff are located in a wide range of central services as well as in departments and in hybrid locations. Centres are often located in Education departments; for example, the Technology-Enhanced Learning Centre at Lancaster University in the UK consists mainly of staff from Education, but in addition there is a loose network of academics involved in the centre's activities from across the university. This network is not dissimilar to the NIDL's wider research network, which builds a community of practice beyond the institute. An illustrative selection of examples of research and development centres with common missions of promoting the use of new technologies in Higher Education is now described.

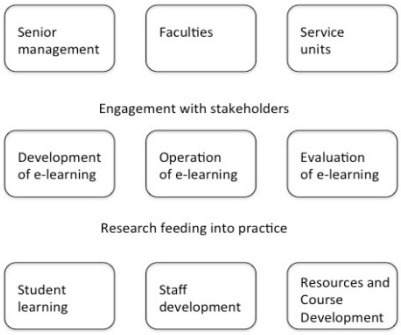


Figure 2. The e-learning research and development cycle and associated influences

Other illustrative examples

The Institute of Educational Technology (IET) has been in place since the inception of The Open University in the UK in the late 1960s. IET undertakes a range of digital learning-related research activities and was one of the first organisations to create an OER repository, OpenLearn. It produces an annual future-focussed horizons report and also offers a Masters in Open and Distance Education (MAODE) which recruits over a hundred students annually, and has a vibrant portfolio of PhD students. IET is centrally located reporting to the Pro Vice Chancellor for Learning and Teaching and has a dual function in terms of teaching/research, and working with faculties to promote the use of digital technologies.

University College London's (UCL) Knowledge Lab was established in 2004, it aims to understand and to develop digital technologies to support and transform education, and beyond. The Knowledge Lab devises new pedagogies, designs and implements innovative

ISBN 978-615-5511-25-7

digital media and smart technologies for teaching and learning, and aims to inform policymakers and educational stakeholders. Activities include: undertaking cutting edge research on digital media and technologies, providing interdisciplinary postgraduate courses, creating empowering technologies for communication and learning that lower the barriers to knowledge and widen access, and incubating enterprise and achieve impact via partnerships with public sector, business and industry.

Another well-established centre is the Centre for Distance Education (CDE) at Athabasca University in Canada. It offers a range of masters and postgraduate courses. Most courses are offered almost entirely online and interestingly the model is not the traditional one of a course starting and finishing at fixed times, instead students can join at any point. The Centre is also home to the Canadian Institute of Distance Education Research (CIDER), which publishes the online journal "International Review of Research in Open and Distributed Learning". The location and organisational structure of research centres should never be taken for granted and this is certainly the case for CDE, which has recently been moved into the Faculty of Humanities and Social Sciences. The key point, nevertheless, is that leading universities serious about harnessing the potential of BOLD new models of education recognise the importance of promulgating a strong research and innovation culture through the strategically aligned activities of research and development centres.

Conclusion

Beetham and Sharpe (2007) argue that e-learning is no longer seen as a technical and administrative tool, existing simply to deliver content. Practitioners continue to seek guidance on pedagogically sound, learner-focused and accessible learning activities, and learning contexts are increasingly rich in electronic and mobile technologies. Research centres such as those described in this paper have an important role to play in terms of understanding how technologies can best be used in education. A number of factors have been shown to contribute to the successful establishment of a research and development centre; including the need for leadership and vision, robust approaches to research, and appropriate channels to feed research findings into policy and practice. In addition, more and more institutions are recognising the need for strategies on the use of digital technologies for education. Flavin and Quintero (2018) provide a useful overview of 44 strategies in UK institutions and considered these in relation to the concepts of disruptive innovation (Bower & Christensen, 1995), sustaining innovation and efficiency innovation. Brown and Beetham (2010) looked at the role of educational technologists and argued that institutions see enhancing the student experience as a high priority. They conclude that educational technology is now seen by institutions to be mission critical. As a relatively new centre, NIDL has had the privilege of building on the experience of establishing a new research and development centre, based on lessons learnt from other centres and what works and what is problematic.

ISBN 978-615-5511-25-7

References

1. Beetham, H., Jones, S., & Gornall, L. (2001). *Career development of learning technology staff: Scoping study final report.* JISC Committee for Awareness, Liaison and Training Programme.
2. Beetham, H., & Sharpe, R. (2007). *Rethinking pedagogy for a digital age: designing and delivering e-learning.* London: Routledge.
3. Bichsel, J. (2013). *The state of e-learning in Higher Education: an eye toward growth and increased access (Research Report).* Louisvill, CO: EDUCAUSE Center for Analysis and Research. Retrieved 2 July, 2018, from https://library.educause.edu/~/media/files/library/2013/6/ers1304.pdf?la=en
4. Bower, J. L., & Christensen, C. M. (1995). Disruptive Technologies: Catching the Wave. *Harvard Business Review, 1*(13), 43–53. Retrieved 3 July, 2018, from https://hbr.org/1995/01/disruptive-technologies-catching-the-wave
5. Brown, M. (2017). A critical guide for policy-makers on the great unbundling of higher education. In G. Ubachs, L. Konings, & M. Brown (Eds.), *The envisioning report for empowering universities* (pp. 10-12). Maastricht: European Association for Distance Teaching Universities. Retrieved from https://eadtu.eu/home/policy-areas/lifelong-learning/publications/392-envisioning-report-for-empowering-universities
6. Brown, T., & Beetham, H. (2010). *The positioning of educational technologists in enhancing the student experience.* ALT occasional paper. Retrieved 3 July, 2018, from https://www.heacademy.ac.uk/system/files/tom_browne_helen_beetham_hea_finalweb.pdf
7. Conole, G. (2013). Designing for learning in an open world. In M. Spector & S.P. Lejoie (Eds.), *Explorations in the Learning Sciences, Instructional Systems and Performance Technologies.* New York: Springer.
8. McCowan, T. (2017). Higher Education, unbundling and the end of the university as we know it. *Oxford Review of Education, 43*(6), 773-748.
9. Davy, T., Meerman, A., Orazbayeva, B., Riedel, M., Galán-Muros, V., Plewa, C., & Eckert, N. (2018). *Future of universities thoughtbook.* Retrieved from http://futureuniversities.com
10. Flavin, M., & Quintero, V. (2018). UK higher education institutions' technology-enhanced learning strategies from the perspective of disruptive innovation. *Research in Learning Technology, 26.* Retrieved 3 July, 2018, from https://journal.alt.ac.uk/index.php/rlt/article/view/1987/pdf_1
11. Gaebel, M., Kupriyanova, V., Morais, R., & Colucci, E. (2014). *E-learning in European Higher Education Institutions.* Retrieved 2 July, 2018, from http://www.eua.be/Libraries/publication/e-learning_survey

ISBN 978-615-5511-25-7

12. Halloran, L., & Friday, C. (2018). *Can universities of today lead learning for tomorrow? The University of the future.* Retrieved from https://cica.org.au/wp-content/uploads/University-of-the-Future-2030-EY.pdf
13. Martindale, J. (2018, March 8). What is a blockchain? Blockchain does way more than power Bitcoin. Here's how it works. Digital Trends [Blog post]. Retrieved 3 July, 2018, from https://www.digitaltrends.com/computing/what-is-a-blockchain/
14. Orr, D., Weller, M., & Farrow, R. (2018). *Models for online, open, flexible and technology enhanced higher education across the globe – a comparative study.* ICDE. Retrieved from https://icde.memberclicks.net/assets/RESOURCES/Models-report-April-2018_final.pdf
15. OUA (2018). *Open Universities Australia Higher Education Marketing Opportunities Overview, Edition 2.* Melbourne: Open Universities Australia.
16. dos Santos, A. I., Punie, Y., & Monoz, J. C. (2016). *Opening up education: a support framework for Higher Education Institutions.* Retrieved 3 July, 2018, from http://publications.jrc.ec.europa.eu/repository/bitstream/JRC101436/jrc101436.pdf
17. Smith, C., & Zenios, M. (2004). E-LEN: a network of e-learning centres. Retrieved 2 July, 2018, from http://www2.tisip.no/E-LEN/documents/ELEN-Deliverables/Guidelines_for_ELEN_centers.pdf
18. UOC (2018). *E-learning research report 2017: analysis of the main topics in research indexed articles.* Retrieved 2 July, 2018, from http://openaccess.uoc.edu/webapps/o2/bitstream/10609/75705/6/ELR_Report_2017.pdf
19. Weller, M. (2018). Twenty years of EdTech. *Educause Review, July/August*, 35-48. Retrieved from https://er.educause.edu/articles/2018/7/twenty-years-of-edtech

ISBN 978-615-5511-25-7

Towards Personalized Guidance and Support for Learning
Proceedings of the 10th European Distance and E-Learning Network Research Workshop, 2018
Barcelona, 24-26 October, 2018
ISBN 978-615-5511-25-7

DON'T DO EVIL: IMPLEMENTING ARTIFICIAL INTELLIGENCE IN UNIVERSITIES

Mark Nichols, Wayne Holmes, The Open University, United Kingdom

Summary

Artificial Intelligence (AI) is changing the ways in which we experience everyday tasks, and its reach is extending into education. Promises of AI-driven personalised learning, learner agency, adaptive teaching and changes to teacher roles are increasingly becoming realistic but the ethical considerations surrounding these, and even simpler innovations are far from clear. Various ethical standards are proposed for AI, though these tend to be high-level and generic and do not serve to guide education practice. The multiple agencies concerned with AI analytics are also yet to provide a strong sense of direction. The Open University UK has established an AI working group to explore the contribution AI might make to improving student retention, success and satisfaction. With a specific emphasis on Artificial Intelligence in Education (AIEd), this paper proposes eight principles constituting an open ethical framework for implementing AI in educational settings in ways that empower students and provide transparency.

Introduction

Artificial Intelligence (AI) has rich potential for any organisation, particularly where there are large amounts of data and repetitive, rules-based functions. AI is already a routine aspect of online experience, its uses ranging from standard searches through to shopping. Cortana, Siri and Alexa are popular examples of AI agents designed to provide personal assistance. For the purpose of this paper, we adopt the view that AI describes "computer systems that have been designed to interact with the world through capabilities (for example, visual perception and speech recognition) and intelligent behaviours (for example, assessing the available information and then taking the most sensible action to achieve a stated goal) that we would think of as essentially human" (Luckin, Holmes, Griffiths, & Forcier, 2016; p.14).

Like many universities, The Open University (UK) is taking early steps to explore the contribution AI might make to student retention, success and satisfaction. While initial work is concerned with symbolic AI (the application of data to automate specific tasks) we are conscious that, eventually, AI projects may adopt neural network-based machine learning (more complex computational approaches). Whatever the approach, and whatever the motivation, the application of AI in educational contexts raises critical ethical questions that have yet to be fully considered or addressed.

Artificial Intelligence

The versatility of AI as a technology gives it incredible scope. At the highest level, AI may be thought of as being either "weak" (based on problem-solving, in the sense of *acting intelligently*) or "strong" (based on consciousness, in the sense of *being intelligent*). Although some research and much popular imagination relates to the development and implications of strong AI, in fact the most fruitful discoveries and economic benefit thus far have been demonstrated by weak AI. Critically, however, weak does not mean simple or limited. So-called weak AI gives the potential for autonomous systems which can be given an objective and can decide, based on an algorithm, how best to meet that objective. Weak AI is the form of AI used in drone delivery services, facial recognition, medical diagnoses, legal services, and crime prediction. The potential of this technology is far-reaching.

Wilson and Daugherty (2018) suggest AI can be used for amplifying, interacting and embodying:

- AI can process vast amounts of data to *amplify* human thinking, by providing useful summaries and further data processing to enhance decision-making and creativity.
- AI can *interact* directly with humans. For example, AI interfaces to frequently asked questions might free specialists for higher-level tasks (including picking up matters the AI cannot adequately deal with).
- AI can physically *embody* computational process and extend human capabilities. For example, robots have been developed to interact with humans as carers, companions and teachers.

The various possibilities of AI are poised to reshape multiple global industries, while many countries are jockeying for leadership positions by linking large-scale investment from central agencies and private sources (Sloane, 2018).

AI ethics

The more powerful AI becomes and the more it becomes a standard feature of daily life, the more critical ethical matters become. AI seeks to apply data in objective ways. However, source data is not immune from bias; there is no such thing as "raw data" (Gitelman & Jackson, 2013). Further, the algorithms designed to process data (the choices that have been made by AI engineers) themselves have ethical consequences. Already examples exist where AI systems reflect sexist, racist and other discriminatory behaviour and where the use of AI systems has reinforced and multiplied negative data in a vicious cycle (Crawford, 2016). It is also clear that even small amounts of personal data can be combined through AI algorithms with the potential to undermine democracy, as illustrated by the recent Cambridge Analytica scandal (Parker, 2018). AI draws on data, and thus faces the same ethical issues as does analytics (Prinsloo & Slade, 2016). AI technologies inevitably reflect the motivations of their developers and interact with a world in which automated decisions have ethical consequences.

There seems unanimous recognition of the importance of ethical principles to direct AI practices, such that the consideration of AI ethics is both timely and urgent (Boddington,

ISBN 978-615-5511-25-7

2017). The UK government is seeking to establish a "Centre for Data Ethics" (Sloane, 2018), while multiple agencies are also investigating the issues. The Leverhulme Centre for the Future of Intelligence, OpenAI, the Ada Lovelace Institute, DeepMind Ethics and Society, the Oxford Future of Life Institute, and the Partnership on AI are among the major agencies already funded to explore the boundaries within which AI should be practised (CFI, 2018; Gardam, 2017; Hern, 2017; OpenAI, 2015; Parker, 2018; Partnership on AI, n.d.). While each agency has clearly laudable goals, thus far the breadth of agency interest has developed more questions than answers. Further, the agencies tend to over-represent AI developers, venture capitalists and the corporate perspective, raising questions over whether they will be thinking broadly and critically enough (Sloane, 2018). Also unclear is the way in which any ethical principles might and will inform legislation, without which the principles themselves may not have sufficient bite to direct practice.

AIED: Artificial Intelligence in Education

Educational potential of AI

Returning to the three areas of potential for AI suggested by Wilson and Daugherty (2018), it is possible to imagine some of the potential for weak AI in education by drawing on their amplifying and interacting categories. For example, AI can process and provide learning analytics data in timely ways to better support students (*amplifying*). Educational data mining has rich potential for improving education support (Luckin et al., 2016). AI bots can directly answer frequently asked questions using voice or chat interfaces (*interacting*). Even in general discussion forums, AI can monitor and respond to FAQ-style queries. AI-driven robots have been used to support children's learning, especially to address the social needs of children on the autism spectrum (*embodying*) (Scassellati, 2007).

AI bots such as Ada (Hussain & Baggaley, 2017) and Jill Watson (McFarland, 2016) are already illustrative of the interactive applications for AI in education. Eventually AI will become more widely applied to such functions as automating grading (for example, with essay grading and feedback tools such as WriteToLearn and Open Essayist), supporting teachers (for example, through chatbot Teaching Assistants), supporting students (via a lifelong AI learning companion), assisting students with special needs through automatic materials adaptation, and otherwise freeing the teacher to focus on high-value tasks such as motivating students and providing additional support and tuition to those who need it (Lynch, 2018).

AIED has particular potential for assisting students requiring additional support (achievement gaps), either by providing additional AI-assisted tuition or by freeing up teacher time (Luckin et al., 2016). However, it is unlikely that AI will replace teachers, even when strong AI becomes available (ibid.). Despite some initial success, Intelligent Tutoring Systems are best suited to limited domains and are expensive to produce (Ferster, 2017).

Ethics in AIED

The lack of definite reference points for approved AI ethics frameworks extends into AIED. Holmes argues that "around the world, virtually no research has been undertaken, no

ISBN 978-615-5511-25-7

guidelines have been provided, no policies have been developed, and no regulations have been enacted to address the specific ethical issues raised by AIED" (Holmes, 2018; para.3). The need for ethical frameworks for AIED is further amplified by the potential for universities, as research-oriented organisations, to experiment on students. To give just one example, Jill Watson (a Virtual Teaching Assistant developed by an academic at Georgia Tech in a large-scale computer science module) was deliberately disguised when implemented. A time-delay was also added to responses, and the bot was given a human-like pseudonym. The comments posted in response to the article that brought Jill Watson to public attention (McFarland, 2016) demonstrate the ethical tension:

> *"Contemptible. Lying to the students about whom they are working with is absolutely inexcusable. They are not paying tuition to be taught by a machine--or, rather, if they are, they have a right to know it."*
>
> *"Why be prejudice[d] against the robot if it is performing as well as a human?"*

It appears that Jill Watson was seen by its developers as just a *technical challenge*, rather than as an intervention with ethical consequences. Even though most of the students appeared to be happy with the experiment, serious questions must be asked about the appropriateness of using deception in the more general application of AI in education.

AIED gives rise to an indeterminate range of questions (Holmes, 2018; Luckin et al., 2016), such as:

- What are the criteria for ethically acceptable AIED, and how might these differ across private organisations (developers of AIED products) and public authorities (schools and universities involved in AIED research)?
- What controls of data should be in place, and what opt-out options are appropriate?
- What is the ethical balance between providing data provision options, and withholding the benefits that might come from using that data?
- How transparent should decision-making algorithms and source data be?
- To what extent Is the data used to train the AI representative, and open to bias?
- Who is responsible and accountable for the AI's performance and the outcomes it leads to?

Such questions must be considered drawing on the expertise of technologists, social scientists, philosophers and pedagogues, in addition to senior administrators and students. Open and transparent implementation frameworks for AIED are urgently required.

AI at The Open University UK

The Open University inaugurated an AI Working Group in early 2018. The purpose of the group is to "provide strategic direction, leadership, design and collaborative working to ensure that the OU appropriately embraces AI technologies to benefit our students and also determine how the OU will become a leading purveyor of AI in Higher Education within the

ISBN 978-615-5511-25-7

UK" (Open University, 2018; para.1). At present membership consists of representatives across "IT, Business Improvement", the faculties, student experience units, the "Learning, Teaching and Innovation" unit, and the sponsors of various Proof of Concept (PoC) projects. Awareness of the ethical issues likely to be raised by implementation prompted the development of a set of principles as an immediate activity.

Proof of Concept projects

Several PoC projects are underway, including chatbot and unstructured (qualitative) data analysis. The two chatbot PoCs will assess two different solutions, one student-facing addressing FAQs and one staff-facing to address People Services (HR) queries. The chatbots will provide first-tier support for standard queries, initially aiding self-navigation and self-service but extending its range of support as it is trained on real queries. The qualitative data analysis PoC will be used to summarise over two million free text data fields of student queries from web forms and forums each year using semantic mining, and provide an interface summarising the data to assist with evidence-based decision-making.

These two PoC project-types give rise to different ethical issues. The first relates to the ethical use of data and the responsibility of an organisation to transparently inform the user that they are engaging with an AI agent. The second highlights the ethical issues surrounding the analysis of sensitive user data.

Principles for implementation: AI at the Open University

In its early days, the OU AI Working Group determined that it needed to properly understand the ethical issues surrounding what is, for the OU, a new way of applying technology to its operations. A distinction is made across development and implementation, so that technical experimentation can take place freely.

The principles draw on four pre-existing sets, applying them for the context of the Open University. The Future of Life Institute Asilomar AI Principles, IEEE Code of Ethics, House of Lords overarching principles for AI and Google AI objectives all inform these implementation principles (Asilomar, 2017; House of Lords Select Committee on Artificial Intelligence, 2018; IEEE, 2018; Pichai, 2018), as do the summaries of AI ethics proposed by IBM CEO Ginni Rometty (Purpose, Transparency, Skills) (DeNisco Rayome, 2017) and IBM Watson CTO Rob High (Trust, Respect, Privacy) (Hiner, 2018). Each of these frameworks emphasise the importance of openness and informed implementation, from the perspective of the organisation (deliberate objectives and staff training) and end users. Additionally, specific mention is required for the use and protection of data both legislatively in the General Data Protection Regulation (GDPR) and OU-specific policies including those related to analytics.

This extensive review gave rise to the following eight principles, all of which will underpin the research and implementation of AI at The Open University UK.

1. We will fully comply with the GDPR and all OU data policies.

ISBN 978-615-5511-25-7

2. We will have full and transparent understanding of the incumbent (as is) and planned (to be) process.
    a. We will engage with all relevant internal stakeholders.
    b. We will process map and validate both as-is and to-be states, consistent with our reference architecture.
3. We will improve the user (internal or external) experience.
    a. We will incorporate appropriate service KPIs for AI solutions.
    b. We will deliberately monitor and act on customer feedback using analytics (ongoing) and a post-implementation survey.
    c. We will maintain a list of lessons learned from each AI implementation.
4. We will provide transparent disclosure at the point of interface.
    a. We will ensure that the user knows they are in an AI environment.
    b. We will ensure the user can learn about the algorithm and the data it makes use of, in a general sense.
    c. We will provide a contact point for anyone seeking additional information.
5. We will ensure a smooth transition to a human when needed.
6. We will ensure all people working in the context of an AI solution are fully trained.
7. We will provide AI solutions with appropriate machine learning algorithms and evaluation points.
8. We will ensure each AI implementation has a named owner and point of contact.

Point 2 picks up on the importance of understanding the role AI will play in the running of the organisation, ensuring informed implementation and overall alignment with how things are done. Point 3 acknowledges that AI solutions must sometimes be given opportunity to prove themselves, and that proof will often need to be evidenced after implementation. In support of point 4, the OU will apply standard text alongside each interface similar to:

> *You are now engaging with an AI interface. Click [here] for more information. To instead engage with a person, click [here].*

Clicking for more information will reveal text similar to the following:

> *This AI function seeks to [objective]. To do so, it makes use of [data] and [algorithm]. Contact [point of contact] for more information.*
>
> *Example: This AI function seeks to provide you with immediate access to relevant policies. To do so, it makes use of your question and checks it against a database of policy information. It will store your query anonymously as part of its ongoing improvement. Contact HR-admin for more information.*

ISBN 978-615-5511-25-7

Such information might also be linked to from the profile of a forum chat bot, appropriately named to ensure transparency. Points 5 and 6 are natural extension of point 2, ensuring that the end-user has a means of escalating their query should the AI not provide an unsatisfactory or questionable result and that the staff associated with such escalations are aware of the AIs working and limitations. Finally, points 7 and 8 guarantee the longevity of, and accountability for, the performance of the AI.

The eight principles for the implementation of Artificial Intelligence technologies at The Open University are designed to reflect robust ethical considerations. Once endorsed by the AI working group, only those instances of AI that comply with the eight principles will be eligible for production. A successful PoC can advance into change management activities that structure ethical concerns into the outcome.

Conclusion

Crawford and Calo remark that analysis of AI "needs to draw on philosophy, law, sociology, anthropology and science-and-technology studies, among other disciplines. It must also turn to studies of how social, political and cultural values affect and are affected by technological change and scientific research" (2016; p.313). If AI is also to be used responsibly in education, a pedagogical analysis will also be necessary. Until formal ethical frameworks emerge for the implementation of AI in education, it is important that universities design AI solutions mindful of their limitations and potential to do harm. The Open University implementation principles aim to ensure that any AI implemented in the university is transparent, and that owners are accountable for their ongoing compliance with ethical issues from the user's perspective. Even once an ethical framework is developed and adopted, it must be continuously updated to anticipate and reflect the breadth of capability for AI.

References

1. Asilomar (2017). *AI Principles – Future of Life Institute.* Retrieved August 17, 2018, from https://futureoflife.org/ai-principles/
2. Boddington, P. (2017). *Towards a code of ethics for artificial intelligence.* Cham: Springer International Publishing. https://doi.org/10.1007/978-3-319-60648-4
3. CFI (2018). *Trust and transparency.* Retrieved August 13, 2018, from http://lcfi.ac.uk/projects/ai-trust-and-society/trust-and-transparency/
4. Crawford, K. (2016, June 25). Artificial Intelligence's white guy problem. The New York Times [Blog post]. Retrieved August 6, 2018, from https://www.nytimes.com/2016/06/26/opinion/sunday/artificial-intelligences-white-guy-problem.html?_r=1
5. Crawford, K., & Calo, R. (2016). There is a blind spot in AI research. *Nature*, 311–313. Retrieved from http://www.nature.com/news/there-is-a-blind-spot-in-ai-research-1.20805
6. DeNisco Rayome, A. (2017, January 17). 3 guiding principles for ethical AI, from IBM CEO Ginni Rometty. TechRepublic [Blog post]. Retrieved from

ISBN 978-615-5511-25-7

https://www.techrepublic.com/article/3-guiding-principles-for-ethical-ai-from-ibm-ceo-ginni-rometty/

7. Ferster, B. (2017, January 21). Intelligent Tutoring Systems: What happened? eLearning Industry [Blog post]. Retrieved August 29, 2018, from https://elearningindustry.com/intelligent-tutoring-systems-what-happened
8. Gardam, T. (2017, December 11). Social well-being and data ethics. Ada Lovelace Institute [Blog post]. Retrieved August 10, 2018, from https://www.adalovelaceinstitute.org/social-well-being-and-data-ethics-tim-gardams-speech-to-techuk-digital-ethics-summit/
9. Gitelman, L., & Jackson, V. (2013). Introduction. In L. Gitelman (Ed.), *"Raw data" is an oxymoron* (pp. 1–14). Cambridge, Massausetts; London, England: The MIT Press. https://doi.org/10.1080/1369118X.2014.920042
10. Hern, A. (2017, October 4). DeepMind announces ethics group to focus on problems of AI. Technology | The Guardian [Blog post]. Retrieved August 10, 2018, from https://www.theguardian.com/technology/2017/oct/04/google-deepmind-ai-artificial-intelligence-ethics-group-problems
11. Hiner, J. (2018, March 2). IBM Watson CTO: The 3 ethical principles AI needs to embrace. TechRepublic [Blog post]. Retrieved from https://www.techrepublic.com/article/ibm-watson-cto-the-3-ethical-principles-ai-needs-to-embrace/
12. Holmes, W. (2018). The ethics of Artificial Intelligence in education. University Business. Retrieved August 10, 2018, from https://universitybusiness.co.uk/Article/the-ethics-of-artificial-intelligence-in-education-who-care
13. House of Lords Select Committee on Artificial Intelligence (2018). *AI in the UK: Ready, willing and able?* Report session 2017-19. London. Retrieved from https://publications.parliament.uk/pa/ld201719/ldselect/ldai/100/100.pdf
14. Hussain, A., & Baggaley, D. (2017). *Bolton College used IBM Watson to build a virtual assistant that enhances teaching, learning and information access – Watson.* Retrieved August 17, 2018, from https://www.ibm.com/blogs/watson/2017/08/bolton-college-uses-ibm-watson-ai-to-build-virtual-assistant-that-enhances-teaching-learning-and-assessment/
15. IEEE (2018). *IEEE – IEEE Code of Ethics.* Retrieved August 13, 2018, from https://www.ieee.org/about/corporate/governance/p7-8.html
16. Luckin, R., Holmes, W., Griffiths, M., & Forcier, L. B. (2016). *Intelligence unleashed: An argument for AI in education.* London. Retrieved from https://static.googleusercontent.com/media/edu.google.com/en//pdfs/Intelligence-Unleashed-Publication.pdf

ISBN 978-615-5511-25-7

17. Lynch, M. (2018, May 5). 7 roles for Artificial Intelligence in education. The Tech Advocate [blog post]. Retrieved August 13, 2018, from https://www.thetechedvocate.org/7-roles-for-artificial-intelligence-in-education/

18. McFarland, M. (2016, May 11). What happened when a professor built a chatbot to be his teaching assistant. The Washington Post [Blog post]. Retrieved August 13, 2018, from https://www.washingtonpost.com/news/innovations/wp/2016/05/11/this-professor-stunned-his-students-when-he-revealed-the-secret-identity-of-his-teaching-assistant/?noredirect=on&utm_term=.70facd03940d

19. Open University, The (2018). *AI Working Group terms of reference.* Internal document.

20. OpenAI (2015). *About OpenAI.* Retrieved August 13, 2018, from https://openai.com/about/

21. Parker, I. (2018, April 26). UK wants to lead the world in tech ethics…but what does that mean? Ada Lovelace Institute [Blog post]. Retrieved August 10, 2018, from https://www.adalovelaceinstitute.org/uk-wants-to-lead-the-world-in-tech-ethicsbut-what-does-that-mean/

22. Partnership on AI (n.d.). *FAQ – The Partnership on AI.* Retrieved August 10, 2018, from https://www.partnershiponai.org/faq/

23. Pichai, S. (2018, June 7). AI at Google: our principles. The Keyword, Google [Blog post]. Retrieved from https://blog.google/technology/ai/ai-principles/

24. Prinsloo, P., & Slade, S. (2016). Student vulnerability, agency, and learning analytics: An exploration. *Journal of Learning Analytics, 3*(1), 159–182. Retrieved from http://oro.open.ac.uk/46172/

25. Scassellati, B. (2007). How social robots will help us to diagnose, treat, and understand autism. In S. Thrun, R. Brooks, & H. Durrant-Whyte (Eds.), *Robotics Research* (pp. 552–563). Berlin, Heidelberg: Springer Berlin Heidelberg. https://doi.org/10.1007/978-3-540-48113-3_47

26. Sloane, M. (2018, July 6). Making artificial intelligence socially just: Why the current focus on ethics is not enough. LSE, The London School of Economics and Political Science [Blog post]. Retrieved from http://blogs.lse.ac.uk/politicsandpolicy/artificial-intelligence-and-society-ethics/

27. Wilson, J. R., & Daugherty, P. R. (2018). How humans and AI are working together in 1,500 companies. *Harvard Business Review, July-August.* Retrieved August 13, 2018, from https://hbr.org/2018/07/collaborative-intelligence-humans-and-ai-are-joining-forces

ISBN 978-615-5511-25-7

Towards Personalized Guidance and Support for Learning
Proceedings of the 10th European Distance and E-Learning Network Research Workshop, 2018
Barcelona, 24-26 October, 2018
ISBN 978-615-5511-25-7

PERSONALISED LEARNING IN DEVELOPING COUNTRIES – IS HIGHER EDUCATION READY?

Jennifer Roberts, University of South Africa, South Africa

Summary

This conceptual paper examines the notion of personalised learning (PL) in a developing country context. The methodology employed is a review of literature and theories of Distance Education, as they pertain to the variables of context, technology, students and teaching staff with respect to PL in developing countries.

Problem

The basic premise of PL is the belief that each student is unique and learns in different ways. It has been suggested that PL actually originated from Howard Gardner's 1983 theory of multiple intelligences (Johnson, 2004).

Many Distance Education (DE) higher education (HE) institutions in developing countries have large student numbers, poor infrastructure, low uptakes of technology use and insufficient levels of digital literature skills. This is exacerbated by the challenges they face with regard to connectivity and bandwidth where both costs as well as accessibility are prohibitive.

PL is growing in importance and popularity in HE circles, but the question that needs to be asked, is whether it is not only possible, but also desirable in developing countries, particularly those employing a DE format.

The research question therefore is:

> *"Are developing countries ready for personalised learning?"*

Personalised learning

"The term personalised learning, or personalisation, refers to a diverse variety of educational programs, learning experiences, instructional approaches, and academic-support strategies that are intended to address the distinct learning needs, interests, aspirations, or cultural backgrounds of individual students", (Stevens, 2017). According to Stevens, PL refers to instruction in which the pace of learning and the instructional approach are optimised for the needs of each learner and typically, technology is used to try to facilitate PL environments. Providing PL experiences that allow all students equal access to quality education according to their needs and interests is an ideal all educators embrace (Lynch, 2017).

It is possible for PL to take place in traditional face-to-face settings as well as technology-enhanced learning environments. When face-to-face teaching takes place, PL often takes place when there is a low student to teacher ratio (Nandigam, Tiramala, & Baghei, 2015). An important element of PL is however its link to the use of technology. Feldstein and Hill (2015) contend that a more accurate term for PL would be "technology-assisted differentiated instruction".

Vassiliou and McAleese (2014), in their report to the European commission on new modes of learning and teaching in HE, put forward that PL pathways can be enhanced with student data, collected through the use of online provision of teaching. According to them, in a face-to-face environment, it is difficult for teachers to monitor the pace and progress of every student. It is their contention that the use of online technologies can therefore make use of data analytics in order to provide this personalised pathway for the students.

An argument can be put forward that personalisation made its appearance in many of the commercial fields e.g. retail and travel. According to Gous and Roberts (2010), the concept of the "New Tourist" was first advanced by Aurelia Poon in her book "Tourism, technology and competitive strategies" (1993). Poon is a leading commentator on future trends in tourism and she advocated that in future tourism would be flexible, segmented, environmentally sound and diagonally integrated rather than mass, rigid, standardised and packaged.

Another example is the retail industry where the original model was based on the "pile them high and sell them cheap" philosophy. The retailers decided which products on which to hang their hats, and then bought them in bulk and sold as cheaply as possible. During the 1980's (around the same time that the tourism industry started presenting flexible options based on consumer desires rather than packaged deals), the large retailers recognised that the customer wanted a larger choice and variety, even if it was a more expensive option.

It can therefore be argued that education is merely following the example of other disciplines that launched personalisation a few decades back. Bradshaw (2011) in the Financial Times (2011) quotes Rupert Murdoch from his speech to the e-G8 conference of internet entrepreneurs and European policymakers in Paris on 24 May 2011 "The same technologies that transformed every other aspect of modern life can transform education"

Methodology

This conceptual paper seeks to bring together various aspects that should be addressed when investigating PL in developing countries, The author acknowledges the scope of this topic is vast and cannot be exhausted in one paper. This particular paper looks at four aspects that are pertinent to the topic and serves as a starting point for the discussions. These four aspects are: an investigation into the actual context of developing countries, the role of technology in PL, the learner perspective and finally the role of the teacher/facilitator. In order to do this, various theories and empirical research relating to learning, distance education and the future roles of distance education staff are examined. In addition, the definition and reports on developing countries are looked at and discussed in the way in that they relate to DE.

ISBN 978-615-5511-25-7

Figure 1 shows the model that provides the basis for this discussion article and demonstrates the link between the four trajectories that are being examined.

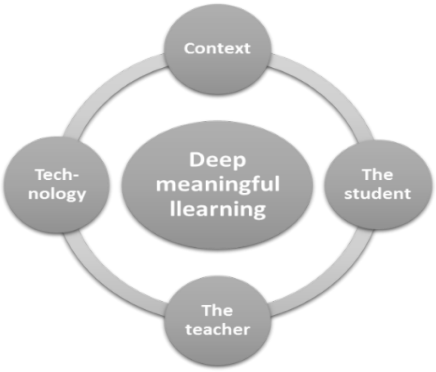


Figure 1. Four aspects of discussion on personalised learning

Context – the distance education institution in a developing country

An analysis of the concept of Open Distance Learning (ODL), within the context of an ODL institution in the developing countries will follow:

Definition of a developing country

There is no universal definition of a developing country versus a developed country. One of the factors used to distinguish developed countries from developing countries is gross domestic product (GDP) per capita. An unofficial threshold for declaring a country to be developed is a GDP per capita of $12,000. This figure is calculated by dividing the GDP by the population. Examples of countries that are classified as developing include Argentina, Brazil, China, Malaysia, Mexico, Russia, India and South Africa. It can be noted that none of these countries are from the Northern America or from Europe.

However, the World Bank (2018) describes developing countries as those countries with a Gross Domestic Income (GDI) per capita per year of less than $995 in 2017. The basic difference between the two is that GDP measures what the economy produces – goods, services, technology, and intellectual property, while GDI measures what the economy makes, tracking aspects like wages, profits, and taxes (Udland, 2015).

Another measuring device is the Human Development Index (HDI) which was developed by the United Nations. This index quantifies life expectancy, education, and income into a standardised number between 0 and 1, and most developed countries have an HDI index of above 0.8 (Investopedia, 2016). According to the Human Development Report (2016), developing countries have an average HDI of 0.668 and their average GNI equates to $9 257.

The following are characteristics of developing countries according to Ayesha (n.d.)

- Low per capita income;
- Excessive dependence on agriculture;
- Low level of capital formation – inequalities in the distribution of income;

ISBN 978-615-5511-25-7

- Rapid population growth and disguised unemployment;
- Lower levels of human capital – education, health and skills;
- Dualistic nature.

Since 2016, the World Bank no longer makes a distinction between developing and developed countries. Instead, it classifies countries into one of four categories according to Table 1.

Table 1: World Bank classification of country groupings

Category	GNI in US Dollars
Low income countries	< $1025
Lower middle income countries	$1025 – $4035
Upper middle income countries	$4036 – $12 236
High income countries	>$12 237

According the International Monetary Fund (IMF) (2018), the following are but a few of the countries that they define as *developing*. They are defined as countries that have an emerging market and a developing economy. Table 2 lists a selection of countries that are classified as *developing* according the IMF. The countries listed here are those where there is a history of DE institutions.

Table 2: Developing countries according to the IMF (2018)

Bangladesh
Brazil
China
Egypt
India
Indonesia
Mexico
Nigeria
Pakistan
South Africa
Turkey

According to the World Bank (2018), more than 80% of the world's population live in developing countries, which includes Africa, most of Asia and Latin America, as well as Russia. They state further that over 50% of HE students in the world, hail from developing countries. A common scenario to many developing countries is the large number of students that seek access to HE. This has led to the concept of mega-universities.

Mega-universities

A mega-university is defined as "a distance teaching institution with over 100,000 active students in degree level courses" (Daniel, 1996; p.29). Table 3 shows how the top 10 mega-universities in the world all hail from developing countries; it indicates that the majority of mega-universities in the world emanate from developing countries with a large population e.g. China, Russia, Philippines, as well as Argentina, Brazil, Egypt, Thailand and Mexico, amongst others. Many of the universities in these countries serve in excess of 200 000 students.

ISBN 978-615-5511-25-7

Based on the criteria mentioned above for a country to be classified as a developing country, Table 3 shows the relationship between the largest mega-universities in the world (by student numbers) and their classification according to the IMF (2018), Human Development Index (HDI) (2016) and Gross Domestic Income (GDI) (Udland, 2015). It can be seen that the top 10-mega universities all hail from developing countries.

Table 3: Comparison of top mega-universities to their country's indicators for being classified as a developing country

Mega-university	No of students	Country	Dev IMF	HDI (2015)	GDI (2015)
IGNOU	4 000 000	India	√	0.624	5 663
Open University of China	2 700 000	China	√	0.738	13 345
Anadolu	1 974 000	Turkey	√	0.767	18 705
Allama Iqbal	1 326 000	Pakistan	√	0.550	5 031
Bangladesh OU	650 000	Bangladesh	√	0.579	3 341
Terbuka	646 000	Indonesia	√	0.691	10 053
Shanghai Open University	610 000	China	√	0.738	13 345
Dr BR Ambdekar	450 000	India	√	0.624	5 663
Unisa	350 000	South Africa	√	0.666	12 087
NOUN	300 000	Nigeria	√	0.527	5 443
NUDE	260 000	Spain	x	0.884	32 779
Korea OU	211 000	Korea	x	0.901	34 541
OU	174 000	United Kingdom	x	0.909	37 931
Madya Pradesh	150 000	India	√	0.624	5 663
Modern Univ of Humanities	140 000	Russia	x	0.804	23 286
Norte do Parana University	130 000	Brazil	√	0.754	14145
National centre for DE	120 000	France	x	0.897	38 085

Although the top ten mega-universities are all classified as coming from developing countries (according to the IMF (2018)) and have a HDI of less than 0.8 as per the HDI (2015), the mega-universities in China, Turkey, Indonesia and South Africa all have a GDI above $995. It is interesting to note that those countries that have been classified as developed countries have a GDI of over $32 000 and an HDI of over 0.8. Figure 2 provides a graphical perspective on the size of the student population at the top 10 mega-universities and their HDI levels.

ISBN 978-615-5511-25-7

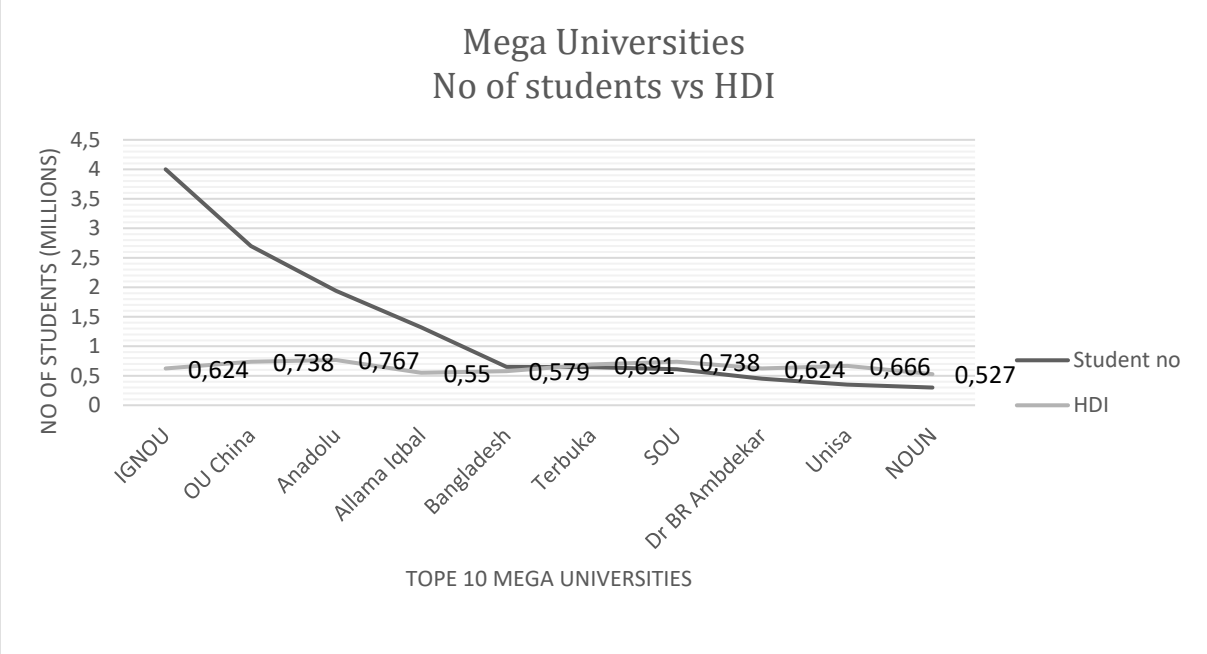


Figure 2. Comparison of student numbers at mega-universities and their HDI

The universities with the highest number of students all display an HDI level of between 0.550 and 0.767 compared with the figures ranging from 0.804 to of 0.909 for the developed countries.

According to Avegrou, Hayes, and La Lovere (2016), there is a marked disparity between the distribution of physical access to the internet, as well as mobile technologies between developed and developing countries. The International Telecommunications (ITU) report (2016) states that almost two thirds of people living in developing countries do not have access to the internet.

From the above it can be deduced that the largest mega-universities in the world all hail from developing countries where the HDI is relatively low. This has a direct impact on PL using technology, as the lack of resources is seen as the root of many of the problems facing HE institution in developing countries, where the government funding per student is significantly lower than the developing nations.

Technology as a mediating tool for Personalised Learning

Many HE institutions in developing countries employ a range of technologies for teaching and learning purposes. Taking the model of Taylor (2001) of 5 generations of DE delivery modes, the 5th generation refers to total online delivery. This is made possible through employing integrated technologies that are reliant on a competent infrastructure, accessibility to reliable internet connectivity, students, and staff who are proficient in digital literacy understanding and skills.

In their report on HE in developing countries (World Bank, 2000), the authors stress the need for better access to technology and resources in order to connect these developing countries to the advancing trends in global teaching. They contend that although recent developments in

ISBN 978-615-5511-25-7

communication technology have improved the viability of DE, economic viability remains problematic due to the high costs and extensive infrastructure requirements.

In this respect, it is prudent to refer to the concept of the Iron Triangle as presented by Sir John Daniel, the former head of the Commonwealth of Learning (COL) (Daniel, 2013), as well as the 5 different generations of distance education (DE) as put forward by Taylor (2001).

The Iron triangle and the 5 generations of distance education delivery

According to Daniel (2013), DE can be represented through the analogy of an Iron Triangle. He states that the challenge in DE is to increase access, improve quality and cut costs. When representing access, quality and costs as 3 vectors, it can be seen how difficult it is to achieve this in a face-to-face teaching environments. As can be seen in Figure 3, the goal of distance education is to optimise the triangle, increasing access and quality and at the same time, to reduce costs. If you pack more students into the classroom to raise access, you could be accused of damaging the quality. Try to up the quality with more and better teachers and learning resources and the costs will go up. Cut costs directly and you will threaten both access and quality.

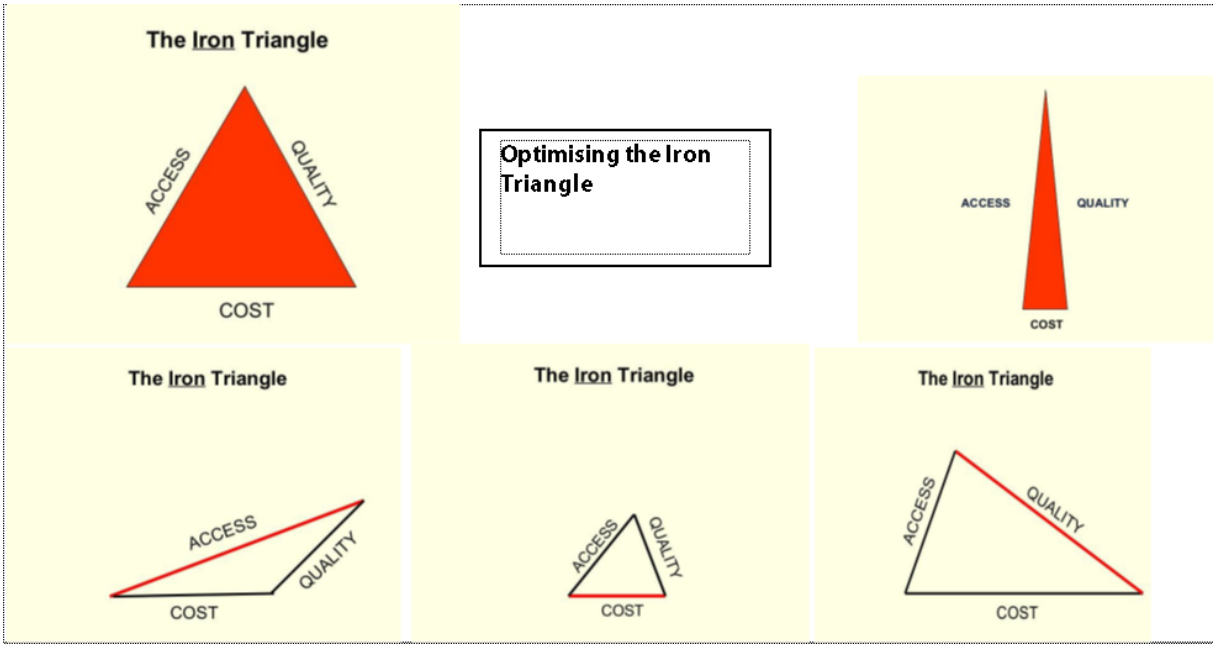


Figure 3. The Iron Triangle

To stretch the triangle and achieve, simultaneously, wider access, higher quality and lower costs, you need technology. The evolution of DE reflects the arrival of a succession of technologies that helped to offer better education to more people through space and time at a reasonable cost. By looking at all the new technologies that are being offered, one can see that both students and lecturers require new meta-skills. As new technologies in education emerge, the challenge is to remember why we are in the field of education – to teach people – a student-centred approach should remain.

ISBN 978-615-5511-25-7

While Daniel (2013) refers to the important role that technology can play in distance education settings, it is also worth looking at the history of the modes of delivery of DE, with particular emphasis on developing countries. Table 1 provides an overview of Taylor's framework for 'the generations of distance education (Adapted from Hedenrych & Prinsloo, 2010; pp.8-9):

Table 4: Five generations of distance education

1st	Correspondence – single medium (print) – mass production of content
2nd	Teleconferencing – audio – communications network – synchronous
3rd	Multi-media and computer-assisted learning – interaction with content
4th	Flexible learning via online delivery – communication enhanced online
5th	Intelligent flexible learning – automated content and responses and campus portals

I would argue that developing countries employ a mix of these 5 generations of delivery. An example is Indira Ghandi Open University (IGNOU) in India where a fusion of technologies is used. IGNOU has a large multimedia centre where radio and video recordings are made and distributed to their learners. However, their main mode of delivery is still correspondence.

The University of South Africa (Unisa) makes use of a blended, hybrid range of technologies with the majority of courses still being delivered via print, while a select number of courses are fully online. According to the Unisa's Open Distance Learning Policy (2016), three different delivery channels are available. Firstly, print media remains the least expensive and most popular delivery mode. The second delivery mode includes technologies with limited student-teacher interaction, where resources such as digital media, satellite broadcasting and online distribution of content and information via the Lerner Management system (LMS) are presented in an asynchronous manner. Finally, a move toward multimedia with interactive possibilities that include audio conferencing and discussion forums in order to support interactive teaching and learning.

Moore's three types of interaction and Anderson's Equivalency theorem

This leads to the various modes of interaction in DE. Moore (1989) introduced his "Three Types of Interaction" in DE, looked at form the students' point of view. In this model, he proposed that there are three different types of interactions: student-teacher, student-student and student-content.

Anderson (2003) expanded on Moore's model and presented the application of the three modes. Figure 4 indicates the three different modes of interaction that are possible within a DE environment (Anderson, 2003).

ISBN 978-615-5511-25-7

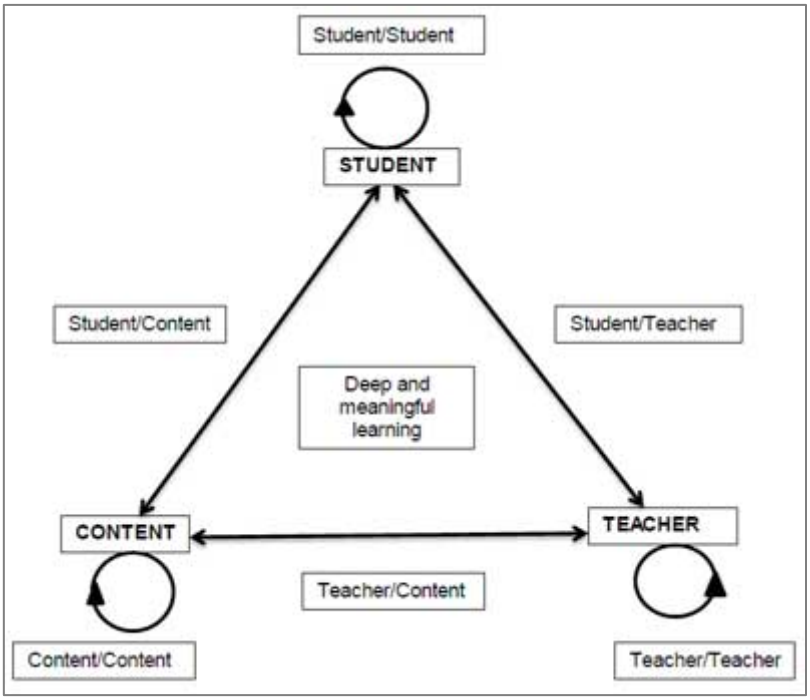


Figure 4. Modes of Interaction

Anderson's (2003) equivalency theorem provides a theoretical base for indicating the amount of each of these interactions that is required for deep, meaningful learning to take place. He proposed 2 theses:

- Thesis 1: Deep and meaningful formal learning can take place as long as one of the three forms of interactions (i.e., student–teacher, student–student, and student–content) is at a high level. The other two may be offered at minimal levels, or even eliminated, without demeaning the educational experience. Therefore, only one of the interactions is necessary at a very high level.
- Thesis 2: By providing high levels of more than one of the interaction types, students will enjoy a more satisfying educational experience. However, using more than one type of interactive experience is not as time and cost effective as using just one type.

Expanding on his 2003 model, Miyazoe and Anderson (2010) suggest that if all types of interaction produce similar learning outcomes, then it does not make sense to opt for the most expensive one – that of student-teacher interaction. Bernard, Abrami, Borokhovski, Bethel, Wade, Tamin, and Surkes (2009) go as far as to state that student-teacher interaction is actually the least effective form of interaction.

Drawing on the context of DE in developing countries, many HE institutions need to provide education to a large number of students and often with very scarce resources. The question to be asked then is to what extent technology is needed to provide a personalised learning experience. Hulsmann and Shabalala (2016) agree and state that there is a disparity between economies of scale and digital interaction in mega universities.

ISBN 978-615-5511-25-7

Learner-centeredness – the students

What makes personalisation different is that it is student-centred and provides students more opportunity for agency around their learning. This can be achieved through collaboration between the learner and teacher to determine and drive the learning process, as well as the individual needs of each student being accommodated by the teacher (Pittcock, 2017). As students need to take ownership of their own agency, this involves a higher level of self-directed learning. Knowles describes self-directed learning (SDL) as "a process in which individuals take the initiative without the help of others in diagnosing their learning needs, formulating goals, identifying human and material resources, and evaluating learning outcomes" (Knowles, 1975).

SDL is a foundation that can help establish features of a personalised system, particularly in helping students to manage their overall learning activities and monitor their own performance (Kim, Olfman, Ryand, & Eryilmaz, 2014).

Mentz and Oosthuizen (2016) highlight the fact that traditional teacher-centred practices are still the norm in most South African schools and HE institutions. This approach does not adequately prepare students for lifelong learning in the 21st century. As a result, SDL has become increasingly important, both in the South African education context, as well as education sciences in the international arena.

According to Green, Facer, Rudd, Dillon, and Humphrey (2005), "the logic of education systems should be reversed so that it is the system that conforms to the learner, rather than the learner to the system. This is the essence of personalisation".

Are our students from developing countries self-directed life-long learners?

Distance education teaching staff

The fourth aspect of PL that needs to be addressed is the role of the DE teaching staff. PL obviously requires new roles and competencies from the teacher and facilitators. The roles of distance educators are evolving as teaching itself reacts the new technologies and learning strategies. Roberts and Bezuidenhout (2016) carried out a content analysis form various literature sources that discussed the roles of distance educators. They identified 10 broad roles and these are: subject specialist, researcher, mentor, student support, technology expert, instructional designer, facilitator, management, administration, and being a team player.

Roberts (2018) undertook an empirical study where teaching staff at Unisa were asked to rank the importance of each of these roles currently, and projected 5 years into the future. In addition, they were asked to rate their own perceptions of the competencies in each of these roles. The results indicated that the roles of the distance educator as a technology expert and online instructional designer escalated in importance between current and future roles. Although, the role of a subject specialist remained top of the list, the role of being a technology expert moved from number 7 to number 2, and instructional designer progressed

ISBN 978-615-5511-25-7

from number 9 to number 5. Both the roles of technology expert and online instructional designer were perceived by the teaching staff to be low.

Effective PL clearly requires a level of expertise in technology and online education. The results from the two studies carried out above indicate that staff development and Continuous Professional Development (CPD) are necessary components to upskill the teaching staff in areas that are vital to implementing PL.

Nancy Kassebaum, a former U.S senator summed it up by stating, "There can be infinite uses of the computer and of new age technology, but if teachers themselves are not able to bring it into the classroom and make it work, then it fails" (Crocker, 2015).

Conclusion and recommendations

The question being asked is whether developing countries are ready to implement PL. In order to address this question, it is imperative that various factors are first studied. In this paper, a cursory look was given into four different aspects of PL in developing countries. The areas that were considered are the actual context of DE in developing countries, technology requirements, the learners themselves and lastly the roles of the teaching staff – see Figure 1.

The top 10 mega-universities in the world, according to different criteria, are all from countries that have been classified as *developing*. It can be concluded then that most DE students worldwide hail from developing countries. In many cases, developing countries have high student numbers, low access to technology due to unaffordability, poor digital literacy skills and lack of access to the internet. In addition, they are hampered by the lack of monetary resources that are necessary to train teachers in the required skills.

It has been established that PL operates most effectively in a technology driven environment. Therefore, my contention is that access to technology increases the disparity between students from developed and developing countries. However, France (2018) cautions against placing too much emphasis on the technology aspect of PL. He states that meaningful learning does not have to take place only in a technology rich environment, but that is can be achieved "through differentiated pedagogy that honours the human condition of learning".

The development of SDL skills in students from developing countries has not been widely researched. It is recommended that this aspect be empirically studied in various developing countries to ascertain their level of SDL skills. A starting point would be the development of SDL programs in schools as well as HE institutions, which will assist students to gain the skills that are necessary for them to develop their own agency in PL.

Further research is required on the training and CPD of teaching staff in DE. The research carried out by Roberts (2018) should be expanded to include results from other developing countries. Teacher training in technology and online instructional design should be at the forefront of these CPD programs.

ISBN 978-615-5511-25-7

This paper is a starting point in the discussions and debates that need to held regarding PL in developing countries. It is the author's hope that these conversions will be initiated and continued on a regular basis so that the specific context of developing countries is understood and encompassed into any plans regarding the implementation of PL.

References

1. Anderson, T. (2003). Getting the mix right: an updated and theoretical rationale for interaction. *The International Review of Research in Open and Distance Learning, 4*(2).
2. Avgerou, C., Hayes, N., & La Rovere, R. L. (2016). Growth in ICT uptake in developing countries: new users, new uses, new challenges. *Journal of Information Technology, 31*, 329–333. https://doi.org/10.1057/s41265-016-0022-6
3. Ayesha, J. (n.d). *Common Characteristics of Developing Countries.* Retrieved March 3, 2018, from http://www.economicsdiscussion.net/developing-economy/characteristics-developing-economy/common-characteristics-of-developing-countries-economics/29990
4. Bernard, R., Abrami, P., Borokhovski, E., Bethel, E, Wade., C., Tamin. R., & Surkes, M. (2009). A Meta-Analysis of Three Types of Interaction Treatments in Distance Education. *Review of Educational Research, 79*(2). doi: 10.3102/0034654309333844
5. Bradshaw, T. (2011, May 24). Murdoch signals push into education. Financial Times [Blog post]. Retrieved July 4, 2018, from https://www.ft.com/content/ed72924c-8630-11e0-9e2c-00144feabdc0
6. Crocker, K. (2015, June 21). Surprise: you still need to teach. Lab Work [Blog post]. Retrieved July 13, 2018, from https://medium.com/lab-work/internet-in-the-classroom-surprise-you-still-need-to-teach-5c640b8f7eea
7. Daniel, J. (1996). *Mega-universities and Knowledge Media: Technology Strategies for Higher Education.* London: Kogan Page Limited.
8. Daniel, J. (2013, February). *Education across space and time.* Keynote address ODLAA summit on 4 February 2013. Retrieved July 12, 2013, from www.odlaasummit.org.au/keynote-speakers.php
9. Feldstein, M., & Hill, P. (2015, November 10). Why Personalized Learning Matters to a New Generation of College Students. Edsurge [Blog post]. Retrieved August 22, 2018, from https://www.edsurge.com/news/2015-11-10-why-personalized-learning-matters-to-a-new-generation-of-college-students
10. France, E. (2018, June 2). Why Are We Still Personalizing Learning If it's Not Personal? Edsurge [Blog post]. Retrieved July 30, 2018, from https://www.edsurge.com/news/2018-07-02-why-are-we-still-personalizing-learning-if-it-s-not-personal
11. Gardner, H. (1983). *Frames of mind.* New York: Basic Books.
12. Gous, I., & Roberts, J. (2010). Can biblical archaeological sites be regarded as destinations for the "New Tourist"? *Journal for Semitics, 19*(1), 128-139.

ISBN 978-615-5511-25-7

13. Green H., Facer, K., Rudd T., Dillon., P., & Humphreys, P, (2005). *Futurelab: Personalisation and Digital Technologies.* Research report. Retrieved August 4, 2108, from https://www.nfer.ac.uk/publications/FUTL59/FUTL59.pdf

14. Hedenrych. J., & Prinsloo, P. (2010). Revisiting the five generations of distance education. *Progressio, 32*(1), 5-26.

15. Hulsmann, T., & Shabalala, L. (2016). Workload and interaction: Unisa's signature courses – a design template for transitioning to online DE? *Distance Education, 37*(2), 234-236. https://doi.org/10.1080/01587919.2016.1191408

16. Human Development Report (2016). *United Nations Development Programme.* Retrieved June 4, 2018, from http://hdr.undp.org/sites/default/files/2016_human_development_report.pdf

17. International Monetary Fund – IMF (2018). *Building a shared future. Annual Report 2018.* Retrieved June 3, 2018, from https://www.imf.org/external/pubs/ft/ar/2018/eng/assets/pdf/imf-annual-report-2018.pdf

18. Investopedia (2016). *Top 25 Developed and Developing Countries.* Retrieved June 3, 2018, from https://www.investopedia.com/updates/top-developing-countries

19. International Telecommunications – ITU (2016). *Measuring the information society report.* Retrieved June 2, 2018, from https://www.itu.int/en/ITU-D/Statistics/Pages/publications/mis2016.aspx

20. Johnson, M. (2004). *Personalised Learning: new directions for schools.* Retrieved June 6, 2018, from https://onlinelibrary.wiley.com/doi/abs/10.1111/j.1468-0041.2004.00370.x

21. Kim, R., Olfman. L, Ryan., T., & Eryilmaz, E. (2014). Leveraging a personalized system to improve self-directed learning in online educational environments. *Computers and Education, 70*, 150-160.

22. Knowles, M. (1975). *Self-Directed Learning.* Chicago: Follet.

23. Lynch, M. (2017). *Is personalized learning the future of education?*

24. Mentz, E., & Oosthuizen, I. (2016). *Self-directed learning research: An imperative for transforming the educational landscape.* Durbanville, South Africa: Aosis.

25. Miyazoe, T., & Anderson, T. (2010). The Interaction Equivalency Theorem. *Journal of Interactive Online Learning, 9*(2).

26. Moore, M. (1989). Editorial: Three types of interaction. *The American Journal of Distance Education, 3*(2). Retrieved from https://www.edglossary.org/personalized-learning

27. Nandigam, D., Tiramala, S., & Baghei, N. (2015). Personalized Learning: Current Status and Potential. *Proceedings of the e-Management and e-Services (IC3e), 2014 IEEE Conference on 2014 Dec 10.*, 111-116.

28. Pittcock, J. (2017). *Personalized Learning: A Student-Centred Approach for Learning Success.* Mac Graw-Hill.

ISBN 978-615-5511-25-7

29. Poon, A. (1993). *Tourism, Technology and Competitive Strategies.* New York: CAB International.

30. Roberts, J., & Bezuidenhout, A. (2017). Technology, Work Roles and Competencies of Educators Facilitating Fully or Partially Via a Distance. *International Journal of Educational Sciences, 18*(1-3).

31. Roberts, J. (2018). Future and changing roles of staff in distance education: a study to identify training and professional development needs. *Distance Education, 39*(1), 37-53.

32. Stevens, K (2017). *Personalising the learner experience: insights from Future Ready Schools.* Retrieved March 2, 2018, from https://www.edglossary.org/personalized-learning/

33. Taylor, J. C. (2001). Fifth generation distance education. *e-Journal of Instructional Science and Technology (e-JIST), 4*(1), 1-14.

34. Udland, M. (2015). *Forget GDP: Here's the new way Wall Street is measuring the US economy.* Retrieved March 4, 2018, from https://www.businessinsider.com/gross-domestic-income-over-gross-domestic-product-2015-5?IR=T

35. University of South Africa – Unisa (2016). *Policy for Open and Distance Education (2016).* Retrieved August 2, 2018, from https://www.unisa.ac.za/static/corporate_web/Content/Colleges/CGS/schools,%20institutes%20&%20research%20chairs/institutes/documents/odl-policy_version5_16Sept08.pdf

36. Vassiliou, A., & McAleese, M (2014). *New modes of learning and teaching in higher education: report to the European Commission.* Luxembourg: Publications Office of the European Union.

37. World Bank (2000). *Higher Education in Developing Countries: Peril and Promise.* Retrieved June 4, 2018, from http://siteresources.worldbank.org/EDUCATION/Resources/278200-1099079877269/547664-1099079956815/peril_promise_en.pdf

38. World Bank (2018). *World Bank Country and Lending Groups: Country Classification.* Retrieved June 4, 2018, from https://datahelpdesk.worldbank.org/knowledgebase/articles/906519-world-bank-country-and-lending-groups

ISBN 978-615-5511-25-7

Towards Personalized Guidance and Support for Learning
Proceedings of the 10th European Distance and E-Learning Network Research Workshop, 2018
Barcelona, 24-26 October, 2018
ISBN 978-615-5511-25-7

OPEN EDUCATION PRACTICES IN HIGHER EDUCATION

Ulf-Daniel Ehlers, Baden-Wurttemberg Cooperative State University, Germany, Elena Trepule, Estela Dauksiene, Marius Sadauskas, Vytautas Magnus University, Lithuania

Abstract

Although OER are high on the agenda of social and inclusion policies and supported by many stakeholders in education, their use has not yet reached a critical threshold in Europe any beyond. We argue that this has to do with the fact that OER as concept focusses mainly on building access. There is too little consideration of whether this will support educational practices or promote quality and innovation in teaching and learning. We continue to argue that OER are moving from a first phase in which the emphasis was on "opening up access and availability" to a second phase where the focus will be on "improving learning quality" through OER. We therefore suggest that the focus should be extended beyond "resource access" to "innovative Open Educational Practices" (OEP). In order to facilitate the shift from OER to OEP, it is important to outline the factors which influence the actual creation, use, sharing and reuse of OER for learners, educational professionals and organizational leaders in one common framework. A framework of this kind would have to be capable of directing stakeholders towards innovative, open education in which OER play the role of improving the quality of learning experiences. In this paper we make available such a framework in form of a guideline for innovation and quality through open educational practice for educational professionals.

Introduction

The report "Beyond OER" (Ehlers et al., 2011) came to the conclusion that Open Educational Resources (OER) in higher education institutions are in in principal available but are not frequently used. In terms of this document, we understand OER as any kind of educational resources written under the terms of any open licenses (such as the licenses for open content provided by Creative Commons) and thus, which are freely available for usage. The study reveals that there are five main barriers with which individuals are faced when they want to use OER: (a) lack of institutional support, (b) lack of technological tools for sharing and adapting resources, (c) lack of skills and time of users, (d) lack of quality or fitness of OER, (e) personal issues like lack of trust and time (ibid). With OER, an old question seems to gain new relevance: if we build it, will they come? (Masie, 2001). Four of five issues are related to lack of supporting components like organizational support, a lack of sharing culture within organizations, lack of skills, quality, trust or time and skills for adaption. Only one element is related to the availability of technical tools for sharing and adapting resources. Not a single barrier relates to the question of accessibility and availability.

The popularity of the concept OER is unbroken today – and even more has reached educational organisations, in particular higher education institutions. Open education – as the more generic term – is on the rise, expressing for instance in the emergence of massive open online courses (MOOCs) with a number of MOOC platforms, showing great potential of providing university level education free from traditional conditions, such as cost and academic background (Jordan, 2014). However, also brings forth new challenges, like credentialing and assessment processes for such free forms of learning (Ehlers, 2018). The number of learners continues to increase in open online environments (Chuang & Ho, 2016). In four years, 4.5 million individuals have participated in free online courses and 245.000 certificates have been issued (ibid.). The development of MOOCs offers other attractive forms of open learning.

The results of the "Beyond OER" study are in line with a more general debate in recent literature on the gap between the concept of "giving away knowledge for free" (Ischinger, 2007) and the actual use of free and open resources for teaching and learning. A literature screening of the last 6 years of OER research reveals that the challenges associated with OER no longer lie in the availability or accessibility of resources but beyond. In addition, for quality assurance and OER: Windle et al. (2010), Philip et al. (2008); for skill demand for OER usage: Beggan (2010), Conole and Weller (2008); for teaching culture and OER: Beggan (2010); for lack of transparency culture: McGill et al. (2008); for conflicting agenda between research and teaching excellence related to OER usage: Browne et al. (2010); for shift from supply to demand side with OER: Browne et al. (2010), Beggan (2010), McGill, Beetham, Falconer, and Littlejohn (2010); for learning design as pedagogical underpinning of OER: Kahle (2008), Boyle and Cook (2003). Thus, Pirkkalainen and Pawlowski (2013) provide a map of 31 barriers to OER use by teachers, which also seems to indicate that the limiting factors for OER-use lie outside the realm of availability and accessibility. In fact, these barriers can be categorized as being due to lack of time, lack of training, lack of policy, lack of support, lack of awareness, lack of quality content, language issues and incompatibility of resources with the educational scenario.

The public debate on OER became more and more aligned with the UNESCO decade program "Education for All" which strived for universal access to primary education by 2015, and now by 2021 (UNESCO, 2014). Since we know that, although there had been progress, this very objective had not been reached, the quest for solutions is more important than ever today. It is clear now that it is not just about open resources. On the contrary, open resources are not more than any other learning materials, not more than simple and plain content – and, although free and open available, only one particular component of high quality learning experiences. An important one, admittedly, but not the only one necessary. Martin Weller discusses MOOCs from a quality perspective in "The Battle for Open" and questions if MOOCs do not bring back the fascination for pure content based courses, fascinating on the one hand side because its reach-out is vast, scary on the other hand because educators seem to give in to spreading content and call it education (Weller, 2014). One could call it a "renaissance of content" within the online learning debate, where we actually feel that we had

ISBN 978-615-5511-25-7

overcome the issue of declaring "content" king – and move more to the issue of context as king of online learning quality considerations.

In this contribution we consider that OER are moving from (what we call) a first phase in which the emphasis was on "opening up access and availability" to a second phase in which the focus is "improving learning quality" through OER. We have therefore earlier suggested to extend the focus beyond "resource access" to "innovative open educational practices" (OEP) (Ehlers, 2014). As OEP, we define "practices which support the (re)use and production of Open Educational Resources (OER) through institutional policies, promote innovative pedagogical models, and respect and empower learners as co-producers on their lifelong learning path" (ibid).

The current situation can be characterized as follows: although OER are high on the agenda of social and inclusion policies and supported by many stakeholders in education, their use has not yet reached a critical threshold. There is a separate but connected debate ongoing about whether this holds true for developing countries as well. However, apart from infrastructure challenges – which are a necessary condition and not to be neglected – the issue of OER usage meets the same challenges there and could be facilitated through creating a culture of openness within institutions through a complementary focus on educational practices in addition to resources. This has to do with the fact that the past and to some extent the current focus on OER is mainly on building more access to digital content. There is too little consideration of whether this will support educational practices or promote quality and innovation in teaching and learning. We consider that OER are moving from a first phase in which the emphasis was on "opening up access and availability" to a second phase where the focus will be on "improving learning quality" through OER. We therefore suggest that the focus should be extended beyond "resource access" to "innovative Open Educational Practices" (OEP). In order to facilitate the shift from OER to OEP, it is important to outline all the factors which influence the actual creation, use, sharing and reuse of OER for learners, educational professionals and organizational leaders in one common framework. A framework of this kind would have to be capable of directing stakeholders towards innovative, open education in which OER play the role of improving the quality of learning experiences.

In order to facilitate the shift from OER to OEP, it is important to outline all factors which are influencing the actual creation, use, sharing and reuse of OER for learners, educational professionals and organizational leaders in one common framework. The "Open Educational Quality Initiative", a European initiative running from 2011 to 2014, has developed such a framework. It outlines dimensions which need to be taken into account when wanting to stimulate a vibrant use of OER and when aiming to transform education and learning in an organisation. The OEP guidelines have been piloted in higher education institutions. They are designed to assist the different targeted stakeholder-groups in the field of Adult Education (AE) and Higher Education (HE) to improve their (re)usage/production of Open Educational Resources (OER) and thus, to foster their Open Educational Practices (OEP). In this paper we want to make available one of the guidelines of the initiative to a wider audience – the guideline for innovation and quality through open educational practice for educational

ISBN 978-615-5511-25-7

professionals. Therefore – in the next section – we first describe the basic idea of OEP, summarise our research results and present a model of the guidelines, designed for educational professionals.

Developing a basic model of Open Educational Practices

In short, open educational practices constitute the adoption of Open Educational Resources (OER) within open learning ecologies. The creation, use, and re-use of open educational resources, as well as the exploitation of open learning ecologies can be challenging for learners and educators, but also for leaders of educational institutions. Policy makers, as well, often need to be made aware of and understand both concepts and can play a strategic role in fostering a rapid uptake of OER and enabling a timely adoption of OEP. In parts the concepts and ideas described in this document are developed as a collaborative exercise of 30 experts in an international workshop at UNESCO in Paris in November 2010. In the first stage, we provide two matrixes which enable a trajectory of openness. The first one presents the constitutive elements of open educational practice (OEP), and the second one touches on the diffusion of open educational practice. They both allow individuals or organizations to position themselves in a trajectory of OEP and to consider the state-of-affairs of their own OEP landscape.

- Constitutive Elements of OEP: The extent to which openness in the related context is applied to the use of resources (free for use = OER usage) and the extent to which openness is inherent in learning scenarios and pedagogies (freedom of choosing and using learning models).
- Diffusion of OEP: The extent to which OEP is embedded as a common practice in the relating context through sharing and collaboration.

Both matrixes constitute essential elements of a) what open educational practices are and b) the extent to which they penetrate a specific context, e.g., an organization or the actual classroom environment. The first matrix suggests different degrees of openness in the usage and creation of open educational resources. The span ranges from "no usage" or "OER usage" to "OER (re-) usage and creation". With these three stages, the scale covers different realities within organizations and/or individual learning behaviour. This dimension of openness in resource usage and creation is set in relation to a dimension of pedagogical practice. The dimension of pedagogical practice is subdivided into three degrees of openness which represent different stages of openness in teaching and learning frameworks. While there is currently no agreed-on classification or definition for "openness" of pedagogical models available, research suggests different aspects of openness or freedom in teaching and learning frameworks. The approach which we adopted to classify pedagogical models/ learning activities regarding their openness follows largely Baumgartner's (2004) approach: teacher – tutor – coach, where the "teacher" represents pretty much the "teaching as knowledge transfer" paradigm and gradually opens up to arrive at a model of learning as co-creation and social practices in the category "coach". While we are aware that this is a simplification of reality we believe still that it is giving prototypical indication of three different and distinct degrees of openness in learning environments. However, other alternative approaches to

ISBN 978-615-5511-25-7

classifying learning activities have been taken into account and which come to similar conclusions, like Paavola, Lipponen, and Hakkarainen (2004) who suggest learning metaphors along acquisition – participation – knowledge creation, Laurillard (1993) or a comprehensive analysis of Mayes and de Freitas (2004) for JISC. Following this analysis, pedagogical levels of "freedom" or "openness" have been conceptualized:

- "Low" if objectives as well as methods of learning and/ or teaching are rooted in "closed" one way, transmissive and reproductive approaches to teaching and learning. In these contexts, the underlying belief is that teachers know what learners have to learn and mainly focus on knowledge-transfer.
- "Medium" represents a stage in which objectives are still pre-determined and given, but methods of teaching and learning are represented as open pedagogical models. They encourage dialogue oriented forms of learning or problem based learning (PBL) focusing on dealing with developing "Know how".
- "High" degrees of freedom and openness in pedagogical models are represented if objectives of learning as well as methods (e.g. learning pathways) are highly determined and governed by learners. Questions or problems around which learning is ensuing are determined by learners (SRL – Self Regulated Learners, Carneiro et al., 2010), and teachers facilitate through open and experience-oriented methods which accommodate different learning pathways, either through scaffolding and tutorial interactions (ZPD Vygotskian inspired approaches) or contingency tutoring (Woods and Woods (1999) strategies of re-enforcement, domain or temporal contingency).

OEP are defined as practices within the trajectory, which is delimitated by both dimensions: openness in resource usage and creation vs. openness in pedagogical models. Both dimensions can help individuals and organizations to self-assess and position their respective context.

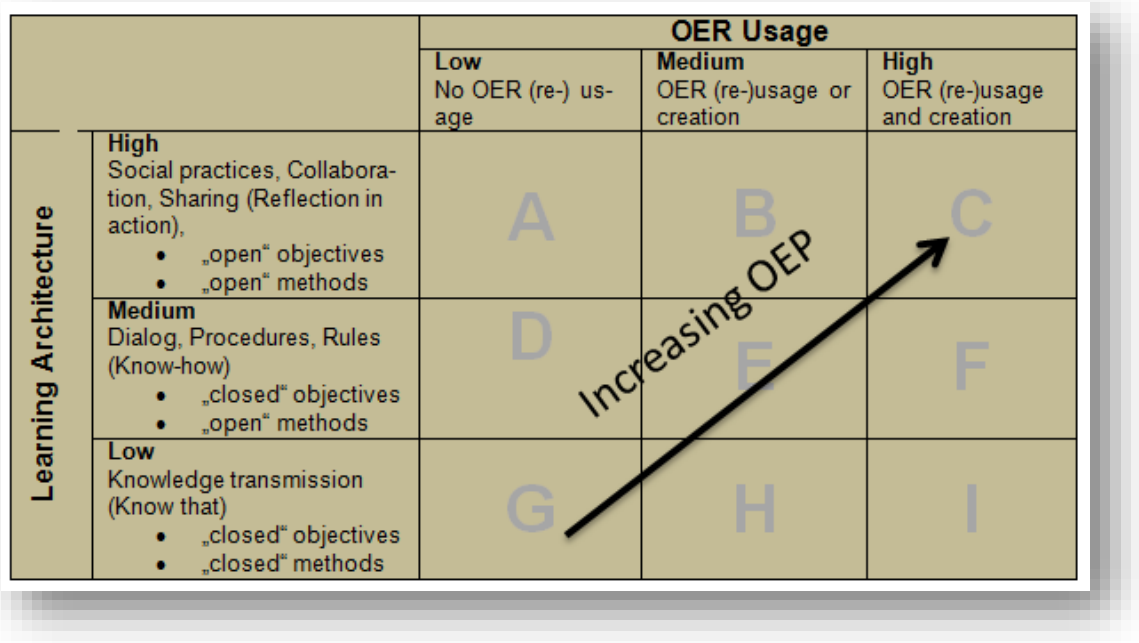


Figure 1. Matrix 1 – Constitutive Elements of OEP

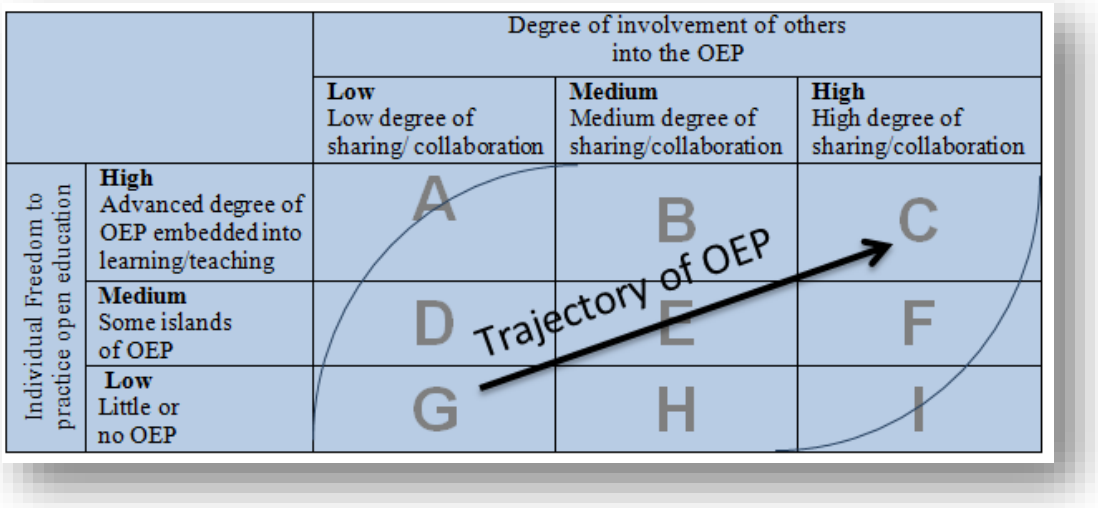
ISBN 978-615-5511-25-7

Using the matrix, we can analyse three examples:

1. Autonomous Learning without OER: A high degree of pedagogical openness (project based learning, etc.) and a low degree of OER usages and creation would result in interactive, autonomous learning contexts without extensive use open educational resources.
2. Lectures with OER: using OER (e.g. a slide set) to give a lecture to students in a directive, knowledge transfer
3. Open Learning Architectures: Whereas a high degree in openness in pedagogical models in combination with a high degree in OER usages and creation result in a high degree of OEP in which OERs are used in open learning architectures (e.g. creation of Learner Generated Content in exploratory, autonomous learning scenarios).

OEP essentially represent a collaborative practice in which resources are shared by making them openly available, and pedagogical practices are employed which rely on social interaction, knowledge creation, peer-learning and shared learning practices. Once an individual or an organization has understood the constitutive elements and principles of OEP which were addressed in the first matrix, they can move on and analyse the diffusion of OEPs within their specific context using the second matrix, presented below. We believe that educational practices are never entirely closed or open and that within educational organizations patterns and configurations of educational practices exist which taken together constitute a diverse landscape.

This has to do with the diverse beliefs and attitudes towards OER and towards open pedagogies. In order to be able to categorize, assess and position the existing landscape of OEP within a given context (e.g. a learner or a teacher in his/her context) they can be mapped against two dimensions: the freedom of an individual to practice open education on the one hand and the involvement of others in OEP, which is expressed in different degrees of shared practices and collaboration. Both dimensions delimit the trajectory of diffusion of OEP for any given context. Matrix 2 shows the different dimensions in combination.



ISBN 978-615-5511-25-7

Figure 2. Matrix 2 – Diffusion of OEP

The dimension, constituting the individual freedom to practice open education, is divided into the three stages:

- "Low" – means that within a given learning/teaching context no open educational practices are encouraged.
- "Medium" – means that within a given learning/teaching context, islands of open educational practices exist, but are not a shared and common reality
- "High" – means that within a given learning/teaching context, open educational practices are embedded into the reality of all learning and teaching activities.

The second dimension of the matrix deals with the question how the OEP is socially embedded, and whether others are involved in OEP as well. It ranges from a low degree of sharing and collaboration to a high degree of sharing and collaboration within a given learning/ teaching context. Both dimensions delimit the trajectory of OEP diffusion. OEP can be encouraged as an individual activity within a given learning/teaching context, but with only little or medium involvement of others to do the same. In contexts, however, in which OEP are embedded into the reality of all learning/teaching activities and at the same time are shared amongst a larger group, then OEP diffusion is high. The matrix shows that the trajectory of OEP diffusion is actually limited. It is unlikely that there is a combination of "little or no open educational practices" with "high degree of sharing/collaboration", also an "advanced degree of OEP embedded into learning/teaching" in combination with "low degree of sharing/collaboration". The matrixes are the core for the first part of a set of tools for three. The tools will be designed to facilitate and guide the improvement of OEP for learners, professionals, leaders of organizations and policy makers. The matrixes can be used by individuals (learners as well as educational professionals) or organizations to position their practices and analyse their individual OEP constitution (Matrix 1) as well as its diffusion (Matrix 2). Within organizations it is important to note that OEP, just like organizational culture, constitutes a status which may be more or less represented.

Research and Development of the Guidelines for open Educational Practices

The guidelines have been developed on basis of a large-scale desk-research on OEPs, analysing mainly institutions on how they deal with OERs in the European context (UK, Ireland, Holland, Germany, Austria, Switzerland, Finland, Estonia, Portugal) but also abroad (Brazil, North America). Through the desk-research over 60 case studies could be extracted, describing common but also context-specific OEPs. This gave us an impression, clear enough, on the one hand, to determine the seemingly relevant stakeholders, and on the other hand, build an initial dimensional model and develop/deduce a standardized questionnaire which we implemented in an online-survey (to get a clearer picture particularly on barriers against using OER). The distribution of the survey was done through networks from institutions like Aalto University, EFQUEL, ICDE, OUUK, UCP, UDE, and UNESCO. This way, more than 20 000 potential respondents from all stakeholder groups were reached, mainly localized in

ISBN 978-615-5511-25-7

Europe but also, outside of Europe. Barriers and success factors could be mapped out for using/reusing/producing OERs. By joining the data from both surveys, the desk-research and the questionnaire, it was possible to build a validated dimensional model for OEP. Regarding those dimensions of OEP, we found there were different levels of maturity a user's can have in each dimension and, depending on the level of maturity, they do different things with OERs in different intensities. As a consequence, we built the "Maturity Matrix", a table that opposes the OEP dimensions on the one axis and the level of maturity on the other axis. The maturity concept for educational professionals is described in the table below.

The Open Educational Practice Maturity Matrix for Educational Professionals

Step 1: Positioning your Organization in the OEP Trajectory

OEP consists essentially of the use of open educational resources in open learning environments/ architectures. The maturity matrix enables you to position yourself in terms of your level of OEP maturity.

Table 1:

	Not yet started	Early stages/ awareness	Developing/ Commitment	Established	Embedded/ Advanced
1. What is your level of expertise in terms of OER?	No knowledge or experience	Some awareness	Knowledge of existing OER initiatives	Good understanding	Expert knowledge
2. To what extent are you using OER?	No use	A little use	Use regularly to support my teaching	Not only use but repurposing of OER	Significant use and repurposing
3. To what extent are you sharing OER and practices?	Not sharing at all	Small amount of sharing	Significant sharing	Regular sharing of both OER and associated practices	Sharing of innovative practices on the creation and use of OER
4. To what extent are you using technologies for the creation and repurposing of OER?	No use of technologies	A little use	Significant use	Regular and innovative use of technologies to create and share OER	Cutting edge development and use of technologies

Step 2: Creating a Vision of Openness and a Strategy for OEP in an Organization

We believe that OEP can be supported through strategic planning. This second part of the OEP guideline helps you to better understand the strategy within your own context. This section is designed to analyse your strategic environment in relation to relevant dimensions of open educational practice strategy of your practice.

Table 2:

	Not yet started	Early stages/ awareness	Developing/ Commitment	Established	Embedded/ Advanced
1. Do you have vision for how to use OER in your teaching?	No vision	An emerging vision of how to use OER in teaching	A good understanding of how to use OER in teaching	A well-developed vision for use of OER in teaching	An innovative and applied vision for use of OER in teaching
2. Are OEP embedded in your practice?	No use of OER	Some use of OER	Regular use of OER in teaching	Significant use of OER in teaching	Sustained and innovative use of OER in teaching

ISBN 978-615-5511-25-7

3. What types of pedagogical approaches are you using with your OER?	No use of OER	Some use of OER, to supported mainly didactic pedagogical approaches	Range of different pedagogical approaches in the use of OER to support different forms of learning	Advanced pedagogical approaches in the use of OER including constructivist and socially situated approaches	Innovative and varied pedagogical approaches to the use of OER
4. Are you involved in any partnerships and/or networks to exchange with other educational professionals about OEP?	No partnerships within the organization or with other colleagues exist with regard to OEP.	Informal links between colleagues and/or teams in relation to OEP exist within my organization.	I have established links between colleagues within our organization to exchange about OEP. We even begin to develop a small number of OEP partnership-projects.	Within my professional context we have now several ongoing and successful partnerships and/or alliances with colleagues to exchange and support the use of OEP.	There are social networks and partnerships to share, co-create and exchange experience and practices on OEP with colleagues.
5. Do you perceive OEP as relevant across the organization?	I do not view OEPs as relevant to my professional context.	I view OEP as relevant to some extent.	Apart from me we have some teams and groups within the organization which start to view OEP as relevant to their own learning/ teaching context.	Me and my colleagues across the entire organization perceive OEP as relevant and desired practices.	OEPs are perceived as a relevant part of the organizations professional work and are communicated as such to professionals, learners, outside partners and clients.

Step 3: Implementing and Promoting OEP

The following section contains dimensions which are important to create a favourable environment for OEP within your context.

Table 3:

	Not yet started	Early stages/awareness	Developing/Commitment	Established	Embedded/Advanced
1. How aware are you of IPR, DRM and copyright regulations for the use of OER?	No knowledge or experience	Some awareness	Basic understanding	Good understanding	Expert knowledge
2. Is there a motivational framework for OEP in existence (e.g. incentives)?	There are no incentives for OEP.	Individuals are motivated to develop and (re-)use OER and use open learning architectures.	Motivation to develop and (re-)use OER and open educational practices on a department or team level is simulated through incentives.	Incentives to stimulate the transformation of educational scenarios and resources into OEP exist on an organizational level.	OEP is supported through an organization-wide motivation framework.
3. Are OEP used?	There is no use of OEP.	OEP are applied in a few courses.	The use of OEP means that we now offer a small number of new courses, using more flexible and innovative delivery methods and OER.	OEP is an established reality organization wide.	OEP are embedded into the organization's culture and are a subject to regular reflection.
4. Do you have tools to support	No tools for supporting the sharing of open	I am starting to use tools for sharing open	Together with colleagues we are adopting tools for sharing and exchange of	Use of digital tools to support sharing and	The use of digital tools which support sharing and exchange of

ISBN 978-615-5511-25-7

sharing and exchanging information about open educational practices?	educational practices (e.g. social networks, blogs, etc.) exist.	educational practices (e.g. social networks, blogs, etc.).	information about educational practices (e.g. social networks, blogs, etc.).	exchange about OEP are a widespread reality amongst me and my colleagues.	information about OEP are embedded into my everyday work as an educational professional.
5. Do you have quality processes in place for your OER?	No quality processes in place	Limited amount of quality control	Good level of quality control	Robust quality processes in place	Quality processes are shared and validated with peers
6. What level of knowledge and skills do you have in relation to open learning architectures and OEP?	I have little or no understanding of open learning architectures.	Some of my colleagues and me have sufficient knowledge to apply OEP.	Knowledge and skills to apply open learning architectures within the organization's educational programs are beginning to diffuse from a handful of to teaching staff more generally.	A significant number of teachers across the whole organization have the skills and confidence to successfully apply open learning architectures.	The vast majority of teaching staff have the knowledge, skills and confidence to successfully and appropriately apply open learning architectures. New open learning architectures are actively developed within the institution.
7. What is your level of digital literacy skills	Basic understanding and use of technologies	Some awareness of social and participatory media	Increasing use of innovative technologies to support teaching	Regular and established use of a range of technologies to support teaching	Innovative and cutting edge use of technologies to support teaching
8. Do you receive any support to develop your OEP?	No support	Some basic training is available	Suite of training opportunities	Advanced support for the creation and use of OEP	Expert knowledge and provide support on the creation and use of OEP to peers

References

1. Andrade, A., Ehlers, U.-D., Caine, A., Carneiro, R., Conole, G., Kairamo, A.-K., Koskinen, T., Kretschmer, T., Moe-Pryce, N., Mundin, P., Nozes, J., Policarpo, V., Reinhardt, R., Richter, T., Silva, G., & Holmberg, C. (2013). *Beyond OER. Shifting Focus to Open Educational Practices.*

2. Baumgartner, P. (2004). The Zen Art of Teaching-Communication and Interactions in Education. In Auer, M.E. & Auer, U. (Eds.), *Proceedings of the International Workshop ICL2004*. Villach / Austria 29 September- 1 October 2004. Villach: Kassel University Press.

3. Beggan, A. (2010). *Opening up: Staff attitudes to open learning. Educational Policy and OpenCourseWare.* Paper presented at the OCWC Global Conference, Hanoi, Vietnam.

4. Boyle, T., & Cook, J. (2003). Learning objects, pedagogy and reuse. In Searle, J. (Ed.), *Learning technology in transition. From individual enthusiasm to institutional implementation* (pp. 31–44). Lisse, The Netherlands: Swets & Zeitlinger B. V.

5. Browne, T., Holding, R., Howell, A., & Rodway-Dyer, S. (2010). The challenges of OER to Academic Practice. *Journal of Interactive Media in Education, 2010*(01), p.Art. 3. doi: http://doi.org/10.5334/2010-3

ISBN 978-615-5511-25-7

6. Carneiro, R., Lefrere, P., Steffens, K., & Underwood, J. (Eds.) (2010). *Self-regulated Learning in Technology Enhanced Learning Environments: A European Perspective.* Rotterdam: Sense Publishers.
7. Chuang, I., & Ho, A. (2016). *HarvardX and MITx: Four Years of Open Online Courses – Fall 2012-Summer 2016.* https://dx.doi.org/10.2139/ssrn.2889436
8. Conole, G., & Weller, M. (2008). Using learning design as a framework for supporting the design and reuse of OER. *Journal of Interactive Media in Education, 2008*(1), p.Art. 5. doi: http://doi.org/10.5334/2008-5.
9. Ehlers, U.-D. (2011). Extending the territory: From open educational resources to open educational practices. *Journal of Open, Flexible and Distance Learning, 15*(2), 1–10.
10. Ehlers, U.-D. (2014). *Open Learning Cultures. A Guide to Quality, Evaluation and Assessment for Future Learning.* New York, Heidelberg: Springer.
11. Ehlers, U.-D. (2018). Higher creduation – Degree or education? The rise of Microcredentials and its consequences for the university of the future. *Conference proceeding of EDEN Conference 2018, Genova.*
12. Ischinger, B. (2007). *Giving Knowledge for Free: The Emergence of Open Educational Resources.* OECD.
13. Jordan, K. (2014). Initial trends in enrolment and completion of massive open online courses. *The International Review of Research in Open and Distance Learning, 15*(1).
14. Kahle, D. (2008). Designing Open Education Technology. In T. Iiyoshi & M. S. V. Kumar (Eds.), *Opening up Education* (pp. 27–45). Cambridge, MA: MIT Press.
15. Laurillard, D. (1993). *Rethinking University Teaching: A Framework for the Effective Use of Educational Technology.* London, New York: Routledge.
16. Masie, E. (2001). *E-learning: "If we build it, Will they come?"* Alexandria, Virginia: The Masie Centre and ASTD Report.
17. Mayes, T. & de Freitas, S. (2004). *Stage 2: Review of e-learning theories, frameworks and models.* JISC desk research study. Retrieved on November 17, 2010, from http://www.elearning.ac.uk/resources/modelsdeskreview/
18. McGill, L., Beetham, H., Falconer, I., & Littlejohn, A. (2010). *UKOER Pilot Programme Synthesis and Evaluation Report.*
19. McGill, L., Currier, S., Duncan, C., & Douglas, P. (2008). *Good intentions: improving the evidence base in support of sharing learning materials* (Project Report). JISC. Retrieved from https://oerknowledgecloud.org/sites/oerknowledgecloud.org/files/goodintentionspublic.pdf

ISBN 978-615-5511-25-7

20. Pavola, S., Lipponen, L., & Hakkarainen, K. (2004). Models of innovative knowledge communities and three metaphors of learning. *Review of educational research, 74*(4), 557–576.

21. Philip, R., Lefoe, G., O'Reilly, M., & Parrish, D. (2008). *A peer review model for the ALTC Exchange: contributing to the landscape of shared learning and teaching resources.*

22. Pirkkalainen, H., & Pawlowski, J. (2013). Global Social Knowledge Management: From Barriers to the Selection of Social Tools. *Electronic Journal of Knowledge Management, 11*(1).

23. UNESCO (2014). *Education Strategy 2014-2021.* Retrieved from http://unesdoc.unesco.org/images/0023/002312/231288e.pdf

24. Weller, M. (2014). *The Battle for Open: How openness won and why it doesn't feel like victory.* London: Ubiquity Press. doi: http://dx.doi.org/10.5334/bam

25. Wood, H., & Wood, D. (1999). Help seeking, learning and contingent tutoring. *Computers and Education, 33*, 153-169

ISBN 978-615-5511-25-7

Towards Personalized Guidance and Support for Learning
Proceedings of the 10th European Distance and E-Learning Network Research Workshop, 2018
Barcelona, 24-26 October, 2018
ISBN 978-615-5511-25-7

UNIVERSITY TEACHER SKILLS AND ATTITUDES TO CREATE AND USE OER

Marius Šadauskas, Margarita Teresevičienė, Estela Daukšienė, Vytautas Magnus University, Lithuania, Ulf-Daniel Ehlers, Baden-Wurttemberg Cooperative State University, Germany

Summary

What is the attitude of university teachers towards OER, their use and creation? What are the skills of university teachers to create and use OER? And how OER transform higher education curriculum? These are the main research questions of this research. In order to answer the research questions, the theory analysis, semi-structured interview, and design-based research were used. The preliminary results of research findings that focus from insights for expert interviews and teacher viewpoints are discussed in the paper.

Introduction

Open education resources are not a new phenomenon; however, it is still indolently used in higher education curriculum. Research (Allen, & Seaman, 2014; Guo, Zhang, Bonk, & Li, 2015) shows that teachers lack time, skills, attitudes and incentives are the main obstacles for OER creation and use.

> *"Opening up education requires a change in attitudes and mindset" (Ossiannilsson, Altinay, & Altinay, 2016; p.159).*

The importance of high quality OER development for educational institutions could be seen as a tool for marketing institution and its courses (Comiskey, McCartan, & Nicholl, 2013). However, the use of OERs in university curriculum may also contribute to the reflection of educators (Elf et al., 2015) and sharing of their practices. Allen and Seaman (2014) research revealed that although university teachers indicate OER discoverability and evaluation and the main barriers while searching for and selecting OER, the discoverability rate of OER compared to traditional resources was very similar.

Guo, Zhang, Bonk, and Li (2015) indicate 5 groups of OER development and usage barriers, stressed by university teachers from China – (a) content, (b) experience, (c) institutional, (d) interface, and (e) habit (of online learning). Their (Guo, Zhang, Bonk, & Li, 2015) research stressed the lack of time and skills, as well as incentives to develop OER, and teacher viewpoint were among the significant obstacles for OER development.

So, what is the attitude of university teachers towards OER, their use and creation? What are the skills of university teachers to create and use OER? And how OER transform higher education curriculum? These are the main research questions of this research.

Research methodology

Qualitative research is based on induction and description of results, and its purpose is to study and understand complex phenomena with their own characteristics, and to present various meanings and attitudes about the investigated phenomenon from the perspective of participants (Merriam, 2002; Creswell, 2007; 2009; Flick, 2009, Žydžiūnaitė & Sabaliauskas, 2017). The lack of research on the identification of the skills and attitudes of university teachers regarding the use of OER, on the needs for the change of high education curriculum towards open online learning and the use of OER, and focus on responding to the learning needs of digital and network society, has led to the selection of a qualitative research paradigm that helps to understand human experience and to reveal the subjective meaning and interpretation of instances of individual experiences without isolating them from the context. In order to answer the research questions, the theory analysis and design-based research were used.

Data collection and research participants

During the first research stage a semi-structured expert interviews with three open-ended questions (about the characteristics of open online learning curriculum, its change and impact on learning process, and finally on OER impact for open online learning curriculum in HE) were used for collecting data from education experts and indicating the main areas of concern and deeper analysis to focus on in further research. The interviews were recorded with the permission of participants; and essential aspects of the interview or further questions were noted in the researcher's dairy. At this stage of the research, the questions for experts were constructed on the basis of theoretical findings and orientated towards research questions.

In this study, the selection of interviewees was used to select those who are most familiar with the research problem and can provide detailed information on needs for the change of open online learning in high education, considering skills, needed for OER creation and use, and integration into the university curriculum. The target selection of interviewees was based on the criteria:

- international expert in open and online learning;
- having at least 10-year expertise, implementing open and online learning in higher education.

The researchers interviewed 13 international experts, based on the fact that such an interview would help to obtain enough meaningful information for research, which would help ensure data saturation. The study involved 7 women and 6 men aged 25-60, with experience in the open online learning from 10 to 18 years, from 8 countries, ranging from policy level experts up to practical application teachers and researchers in universities and companies.

ISBN 978-615-5511-25-7

Based on the interview findings, a design-based research was prepared. It was started with the state of art survey, which included an ATOER scale (developed, tested and validated by Mishra, Sharma, Sharma, Singh, and Thakur (2016)) for assessing the attitude of Lithuanian teachers towards OER. This teacher attitude survey was one of the initial design-based research steps, and it was followed by OER creation (using slidewiki tool) and integration into curriculum, all taking place and under suggested scenario, then curriculum testing and analysis of the findings. The survey including ATOER scale was used twice: first, with teachers having little experience in creating OER, and repeated with the same teachers after they've used slidewiki tool for OER creation. The next steps of design-based research are planned to be followed by teacher focus group discussions, student surveys, and teacher interviews on their experiences in creating and sharing OER, integrated into curriculum.

This initial state of art survey of design-based research was performed with 30 Lithuanian teachers (15 university teachers and 15 VET teachers) who filled in the survey after participation in the trainings on how to create OER using slidewiki tool in April 2018. From April 2018 to August 2018 the teachers created OER and integrated them into curriculum using provided scenario. The second survey on teacher attitude and skills was launched in September 2018, it included the same ATOER scale to indicate if there were any changes in teacher attitude towards OER, sharing and adaptation. Teachers are testing the curriculum (with integrated OER) from September 2018 to January 2019.

Data analysis

Qualitative data of the semi-structured interview were analysed through thematic analysis, based on the steps documented by Braun and Clark (2006; 2013) and provided with guidance in applying the six-phased method (Nowell et al., 2017): (a) Familiarizing with data; (b) Generating Initial Codes; (c) Searching for Themes; (d) Reviewing Themes; (e) Defining and Naming Themes; (f) Producing the Report.

Certain preliminary broad theme nodes were provided to describe the phenomenon of research, however, the data was essentially processed on the basis of the inductive research logic, since the underlying themes and subthemes were formed directly from the results of the empirical data. In other words, the empirical data were specified and supplemented with preliminary nodes of the themes, discovering themes from the data itself.

The study was initially guided by the principle of volunteering (Allmark, 2002; Flick, 2009; Smith et al., 2012), an email agreement was received from the participants to participate in the interview. The investigation was confidential (no one except the researcher cannot use information provided) and anonymous – without disclosing the identity of the participants in the investigation (Allmark, 2002; Creswell, 2007; 2009; Flick, 2009; Smith et al., 2012).

The initial teacher survey data were summarized and analysed using MS Excel to indicate state of art of teacher approach to OER, noting the tendencies and comparing the differences of VET ant university teacher approaches. The data analysis of this survey is going to be followed by statistical analysis in the second round, when the second survey results are available. The

ISBN 978-615-5511-25-7

data from the second teacher survey will be analysed and used to indicate the change in teacher approach and skills for OER creation, after the experience of OER creation and integration into curriculum. The analysis will take place from the end of September to October 2018. The initial findings will be presented in research workshop.

Research findings

The thematic analysis of semi-structured interviews revealed that universities are changing and they need to change – "universities have to adopt to processes like accreditation" (I7) and recognition of open content (I8); "from educational perspective we need to be open to the source of changes that are going on" (I8); "universities are not organized around the needs of students" (I9). Experts stressed that "every change has to come from inside the educators" (I12) and the change in curriculum is important, necessary (I7) and going on (I3, I5). It was pointed that teachers and the curriculum they deliver need to change to adopt to learner needs and other processes, driven by technologies and openness (I5, I9, I11, I12, I13).

> *"As sharing is one of the key features of the digital society, the role of OER is increasing. It is important not to repeat and not to 'rediscover the bike', but to use what has been found and has already been done" (I1)*

> *"Do not design new Simon. If you know exactly that the Simon already exists, just use this Simon, and say thank you to the person that you can use this…" (I5).*

OER impact was noted to be important (I3, I4, I7, I8, I11), but still not sufficient (I3, I4, I5, I9, I11, I12), or "even very very little" (I9) – "OER is slowly arriving" (I5), but it has still not reached the mainstream (I5, I10). Experts also mentioned that there are existing forces that want to prevent from this change (I8, I2) that OER are bringing. Raising teacher awareness on OER (I10) and transforming their "way of thinking" (I11) was emphasized. The insights of different teacher patterns of using educational materials (I2, I8, I9) and attitudes towards OER (I2, I10) were also underlined by experts, leading to thorough research in the topic.

Initial Lithuanian teacher survey revealed that most teachers, selected for OER creation and development had a positive attitude towards OER and sharing, noticing that VET teachers had more positive attitude than university teachers. It was revealed that 80 % of the teachers thought that It was a pleasure if someone adopted or adapted their educational resources and most of them (73%) agreed that sharing enhances their personal and organizational reputation. Also, it was positively assessed that sharing of educational resources increased teacher profile amongst peers and others, and that OER increased the network and sphere of influence, promoted collaboration, and sharing OER encouraged others of doing so (70% of teachers agreed with all statements). However, it was controversially assessed by university and VET teachers a responsibility of a teacher to share all their created educational resources – although generally half of the teachers agreed and the other half was not sure or disagreed, making separate analysis of university and VET teacher responses it was found that more of university teachers disagreed (47%) in sharing all their created resources than agreed (40%),

ISBN 978-615-5511-25-7

while 60% of VET teachers were tend to agree (and only 13% to disagree) that it was their responsibility to share all created educational resources.

Initial Lithuanian teacher also survey revealed that many teachers (37%) are not sure of what impact OER creation had upon their recognition at global level, however the other (60%) tended to think positively. Research also showed that 33% of the teachers were not aware of what were their feelings, if someone used their OER, leading to the assumption that they had not shared OER previously. The 33% of teachers were also not sure, if creation of OER is driven by student academic requirements, and generally 43% tended to agree and 23% to disagree. However, when analysing VET and university teacher opinions separately, it was noted that 40% of university teachers disagreed (40% were undecided), while 67% of VET teachers agreed (27% were undecided) that they adopted OER as this fulfilled academic requirements of their students. Some of the summarized insights and other ideas, revealing teacher attitude towards OER are presented in Figure 1.

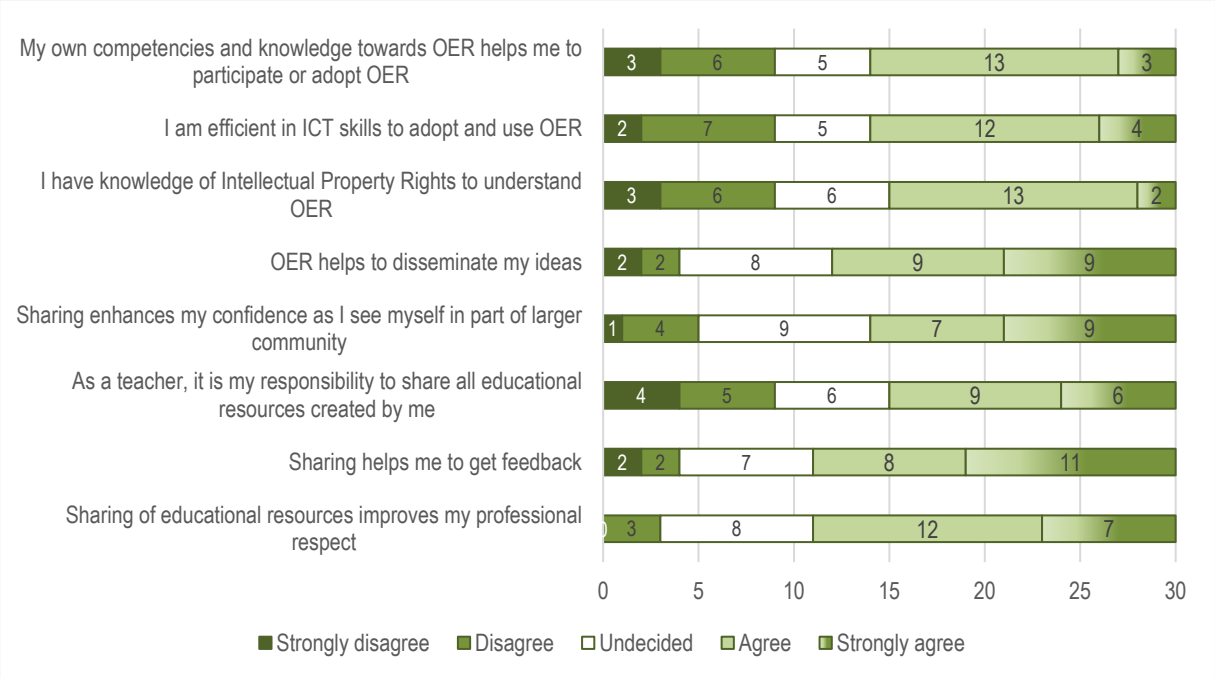


Figure 2. Attitude to OER creation and use by Lithuanian teachers

The theoretical considerations of the paper and further empirical research will be complemented in the further stages of a four-year research project "Open Online Learning for Digital and Networked Society (3.3-LMT-K-712-01-0189)". Project is funded by the European Social Fund according to the activity "Improvement of researchers" qualification by implementing world-class R&D projects' of Measure No. 09.3.3-LMT-K-712.

References

1. Allen, I. E., & Seaman, J. (2014). *Opening the curriculum: Open Educational Resources in US Higher Education.* Retrieved from http://www.onlinelearningsurvey.com/oer.html
2. Allmark, P. (2002). The ethics of research with children. *Nurse Researcher, 10*, 7-19.

ISBN 978-615-5511-25-7

3. Clarke, V., & Braun, V. (2013). Teaching thematic analysis: Overcoming challenges and developing strategies for effective learning. *The psychologist, 26*(2), 120-123.
4. Creswell, J. (2007). *Qualitative inquiry and research design: Choosing among five approaches* (2nd ed.). Thousand Oaks, CA: Sage.
5. Creswell, J. (2009). *Research design: Qualitative, quantitative, and mixed methods approaches* (3rd ed.). Thousand Oaks, CA: Sage.
6. Comiskey, D., McCartan, K., & Nicholl, P. (2013). iBuilding for Success? iBooks as Open Educational Resources in Built Environment Education. *Proceedings of the International Conference on E-Learning*, 86-93.
7. Elf, M., Ossiannilsson, E., Neljesjö, M., & Jansson, M. (2015). Implementation of open educational resources in a nursing programme: experiences and reflections. *Open Learning, 30*(3), 252–266. http://dx.doi.org/10.1080/02680513.2015.1127140
8. Flick, U. (2009). *An introduction to qualitative research* (4th ed.). Sage publications Ltd.
9. Guo, Y., Zhang, M., Bonk, C. J., & Li, Y. (2015). Chinese Faculty Members' Open Educational Resources (OER) Usage Status and the Barriers to OER Development and Usage. *International Journal of Emerging Technologies in Learning, 10*(5), 59-65. doi:10.3991/ijet.v10i5.4819
10. Merriam, S. B., & Associates (2002). *Qualitative research in practice*. San Francisco: Jossey-Bass.
11. Mishra, S., Sharma, M., Sharma, R. C., Singh, A., & Thakur, A. (2016). Development of a Scale to Measure Faculty Attitude towards Open Educational Resources. *Open Praxis, 8*(1), 55–69. doi: http://dx.doi.org/10.5944/openpraxis.8.1.236
12. Nowell, L. S., Norris, J. M., White, D. E., & Moules, N. J. (2017). Thematic Analysis. Striving to Meet the Trustworthiness Criteria. *International Journal of Qualitative Methods, 16*, 1-13, doi: 10.1177/1609406917733847
13. Ossiannilsson, E., Altinay, Z., & Altinay, F. (2016). Transformation of Teaching and Learning in Higher Education towards Open Learning Arenas: A Question of Quality. In P. Blessinger, & T. Bliss (Eds.), *Open Education International Perspectives in Higher education* (159-178), UK, US, and Australia: Open Book Publishers. doi: http://dx.doi.org/10.11647/OBP.0103.08
14. Smith, J. A., Flowers, P., & Larkin, M. (2012). *Interpretative Phenomenological Analysis. Theory, Method and Research* (2nd ed.). London: SAGE.
15. Žydžiūnaitė, V., & Sabaliauskas, S. (2017). *Kokybiniai tyrimai: principai ir metodai*. Vilnius: Vaga.

ISBN 978-615-5511-25-7

Towards Personalized Guidance and Support for Learning
Proceedings of the 10th European Distance and E-Learning Network Research Workshop, 2018
Barcelona, 24-26 October, 2018
ISBN 978-615-5511-25-7

OPEN VIRTUAL MOBILITY: A LEARNING DESIGN 4 SRL

Gemma Tur, Santos Urbina, University of the Balearics Islands, Spain, Olga Firssova, Kamakshi Rajagopal, Open University the Netherlands, The Netherlands, Ilona Buchem, Beuth University of Applied Sciences Berlin, Germany

Summary

The Open Virtual Mobility Erasmus+ project is aimed at promoting Virtual Mobility in the European Higher Education Area. Self-regulated learning (SRL) is an important approach over the whole project in two main lines of work and research: firstly, SRL is explored as a subset of skills of the Open Virtual Mobility competencies; secondly, the learning design of elements and strategies in the Learning Hub/MOOC to be built is established in order to develop students' SRL skills. This paper presents the analysis in which the SRL approach in the OpenVM is rooted, and examines the reviewers' assessment of the extent to which each element can support SRL.

Introduction

Higher Education is currently facing two main challenges: digitalisation and internationalisation, both of which can be addressed by the promotion of Virtual Mobility (VM) in virtual and open environments. VM has been one of the most frequently implemented policies for the European Higher Education Area as it has been a key action for the enhancement of intercultural and multilingual skills as well as others related to personal development (Buchem, Tur, & Urbina, 2018). VM is conceptualised as an ICT-supported (online) learning activities for students, organized and supported at institutional level. Through VM, students from one (European) university can study online at another university enjoying the full support of the host university including formal assessment, since the cooperation between university is formalized through agreements between the two institutions and the student (Ubachs & Henderikx, 2018).

Development of the Open VM concept includes open learning and contexts in which the learner and not the institutions take the lead in VM, adding a new and valuable potential for these aims. Open education and open learning mean that the learner is free to follow education anywhere, free of curricular and other institutional constraints, often free of charge or lower fees than through more traditional universities. The implications for institutionalized virtual mobility are however unclear.

The Open Virtual Mobility Erasmus+ project is aimed at developing understanding of the potential of connecting the two concepts – Open Education and Virtual Mobility – and promoting virtual mobility skills in the context of opening up Higher Education. The

openVM project (https://www.openvirtualmobility.eu) is a strategic partnership involving nine partners from the European region. It offers the support to students, teachers and other agents such as learning designers, leaders and policy-makers in the development and promotion of virtual mobility actions in open ecologies. By way of support, the projects' objectives include development and validation of a theoretical framework of skills and competencies that learners (can) develop through OpenVM, for example in the a OpenVM Learning Hub that aggregates a wide range of functionalities and information sources for Open VM participants, a MOOC and Open Educational Resources (OER) as sources of learning, as well as e-assessments and open credentials (Open badges) as a way to validate and recognize learning outcomes in context of OpenVM.

To construct an OpenVM competency framework, the Group Concept Mapping (GCM) methodology was applied (Kane & Trochim, 2007) in the project. All project members participated in the study and introduced the study to their networks thus facilitating the involvement of a broader representation of experts in the domains of virtual mobility and open education. GCM supports knowledge construction through the collection and organisation of ideas of individuals on a particular issue and produces an aggregated representation of all collected input that can be then further analysed, interpreted and used to feed understanding, design and /or decision or policy making. Over 30 experts took part in different phases of data collection, interpretation and validation, resulting in the creation of a competency framework that includes eight OpenVM competency areas including seven types of transversal competencies and domain knowledge, i.e. knowledge about Open / Virtual Mobility. According to this framework, the seven transversal OpenVM competencies are: open-mindedness, intercultural skills, interactive and collaborative learning, networked learning, media and digital literacy, autonomy-driven (self-directed) learning and active self-regulated learning (Buchem et al, 2018; Rajagopal, Firssova, Op de Beeck, van der Stappen, & Buchem, in preparation). All seven competency areas are relevant and interesting for further elaboration. This paper, however, will focus on self-regulated learning since open virtual environments demand learners who are capable of strategic learning to design and choose their own learning path along contexts and through a life-time (self-directed) as well as being able to carry out their learning experiences by controlling the process through a cycle of planning, performing and assessing their learning (self-regulated). In this regard, the OpenVM project answers to this additional potential from a double perspective: firstly, by including self-regulated learning as a set of skills to be considered within the OpenVM competence framework; and secondly, through a learning design and instrumentation which enhances self-regulated learning.

The current article presents a study evaluating to what extent these two aims are aligned by assessing the extent to which various design elements (i.e., OpenVM Learning Hub, MOOC, OER, Open Badges, e-assessment) effectively promote the development of self-regulated learning skills.

ISBN 978-615-5511-25-7

Self-regulated Learning

SRL is normally connected to "learning how to learn" (Mikroyannidis et al., 2014; p.148), which is a task carried out by the learner in a proactive way and using metacognitive, motivational and behavioural schemes. Self-regulation is a process in which academic skills emerge from cognitive abilities developed in social environments (Zimmerman, 2002). There are different models of SRL, and one of the most popular which has received considerable attention in the context of educational technology (see for example, the most well-known model by Dabbagh & Kitsantas, 2012) is the cycle described by Zimmerman (2002; pp.67-69), which includes the following general three phases and six sub-phases:

- *Forethought phase*, which is about the metacognitive tasks performed before learning occurs. It includes two subsets of tasks in relation to task analysis, including goal setting and planning in a strategic way, and self-motivation beliefs, which is about the self-efficacy beliefs that can influence outcome expectations.
- *Performance phase*. This includes the learning tasks carried out while performing learning and these can be divided into two main groups: self-control, which is about deploying the strategies that were planned in the previous phase, and self-observation, related to the monitoring of one's learning performance.
- *Self-reflection phase*, which occurs mainly at the end of the learning process and it consists of two main processes in relation to self-judgement and self-reaction. The former is about the assessment in relation to standards or other colleagues' achievements whereas the latter is about the willingness whether or not to continue the current learning process. Thus this is a critical phase as it may impact further new learning cycles with positive motivational and self-efficacy beliefs.

The Learning Hub, MOOC and other elements in the OpenVM project

To address the main aim of the project and in order to contribute to the uptake of OpenVM skills to a large scale in the European Higher Education, the main challenge of the OpenVM project has been to create a Learning Hub (https://www.openvirtualmobility.eu/learning-hub/446-learning-hub) envisaged to become the reference for teachers, leaders and students for open virtual mobility by offering examples of good practices, giving support for their design and implementation, joining interested agents for collaboration in OpenVM actions as well as by assessing and recognising Open/VM skills (Buchem et al., 2018).

The Learning Hub includes elements and other innovative strategies, methods and tools for the achievement, assessment and recognition of OpenVM skills, which can be described as follows (Open Virtual Mobility, 2018): MOOC, Open Educational Resources, Open Badges, e-assessment, gamification, semantic skills directory and a matching tool to support group formation and collaboration.

As established in the Quality Assurance Framework the OpenVM is concerned about the pedagogical design, which is a key quality characteristic for the success of most elements such as the MOOC, the OER and the Open Badges (Buchem, Tur, & Urbina, 2018). The inclusion

ISBN 978-615-5511-25-7

of these elements for SRL aims is justified based on diverse arguments. Although all elements are assessed throughout the different phases in the cycles, the inclusion in the project comes from a particular approach in the project. So, for example, the Learning Hub and MOOC are about the digital environment whose design can facilitate the metacognitive skills for autonomous and self-driven learning at the forethought phase as an overview of all elements included. The OER are the didactic resources that will mediate the performance by students. And, the Open Badges and the e-assessment are closely related to the self-reflection phase of the SRL cycle by Zimmerman (2002). Finally, the skills directory is another element to give an overview of the OpenVM skills, and the matching tool is closely related to the social context in which Zimmerman (2002) described the transformation of cognitive skills into academic skills.

The study

Methodology and instruments

To explore the extent to which the inclusion of particular design elements promotes the development of self-regulated learning skills, a descriptive approach based on the quantitative data collected through a survey was carried out. The survey included eight questions about each element or didactic strategy conceived in the Learning Hub or MOOC.

For each of the eight elements, a total of six sub-phases of the SRL cycle by Zimmerman (2002) have been added. Participants are seven internal reviewers, who answered the survey based on the knowledge of the work carried out so far in the design of the elements and strategies for the OpenVM Learning Hub including the OpenVM MOOC. Following the QAF mandate (Buchem, Tur, & Urbina, 2018), rooted in the Design Based Research model (Reeves, 2006; McKenney & Reeves, 2012), innovations in the OpenVM project are assessed in three rounds, firstly by internal reviewers, then by external reviewers and finally by target users. Therefore, this is a first review half-way through the design in order to assess the extent to which the SRL cycle is addressed and enabling changes to be made at an early stage.

Results

The following figures (Figures from 1 to 7) present data collected on each question of the survey. In general, at first glance, it can be observed that answers are irregular and unbalanced, ranging from some disagreement in a few elements to a greater or total agreement in other elements. The Learning Hub (Figure 1) achieves some answers in total agreement in five of the six sub-phases of the SRL: only self-reaction does not achieve a total agreement although there are a balanced number of answers (3 reviewers) at levels 3 and 4 of agreement. Also, the task analysis phase is the only phase for the Learning Hub in which a total disagreement appears.

ISBN 978-615-5511-25-7

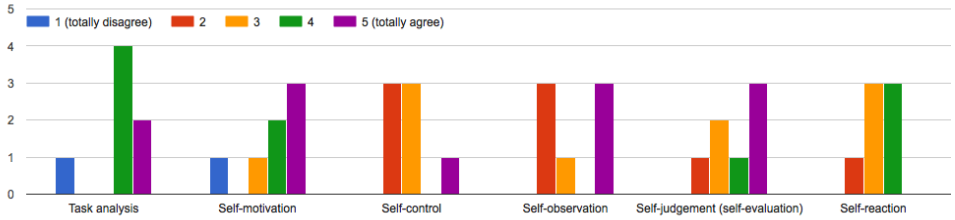


Figure 1. Agreement on the statement:
"The OpenVM Learning Hub can help develop the following SRL skills …"

The MOOC (Figure 2) seems to be valued for the planning of learning, as a first step in the SRL learning, since it is the only phase in which there are no answers in disagreement, and most reviewers give marks between levels 4 and 5. Some issues seem to emerge in the self-control (performance phase) and self-judgement (self-reflection) sub-phases.

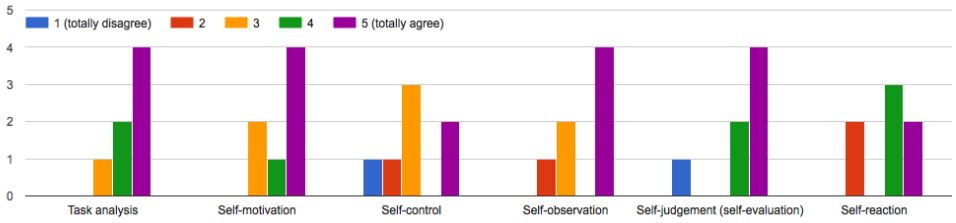


Figure 2. Agreement on the statement:
"The MOOC can help develop the following SRL skills …"

OER (Figure 3) only received total disagreement for the task analysis sub-phase, although in all the other areas, except for self-judgement, there is also some disagreement. However, at the same time, all the sub-phases, except for self-reaction, receive answers in total agreement. Surprisingly, the one with more answers in total agreement is also the one which receives the answer in total disagreement (task analysis).

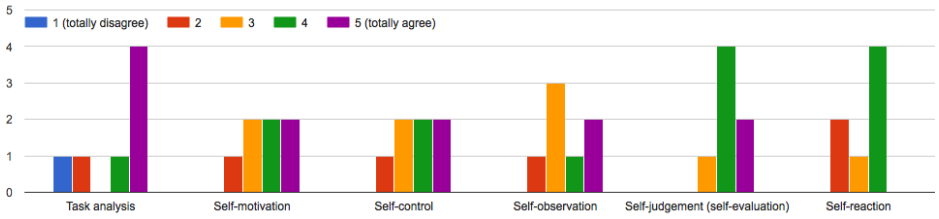


Figure 3. Agreement on the statement:
"OER can help develop the following SRL skills …"

As for Open Badges (Figure 4), self-motivation and self-observation are the sub-phases which achieve the highest levels of agreement, in all the elements, with all reviewers' answers ranging from agreement (level 4) to total agreement (level 5). Very similar is the case of the self-

ISBN 978-615-5511-25-7

judgement phase which only differs from the previous in that it achieves some answers at level 3 in detriment to level 5. However, it is also remarkable that all phases may present some issues for SRL as there is some disagreement in one sub-phase (task analysis in the forethought phase; self-control in the performance phase; and, self-reaction in the self-reflection phase).

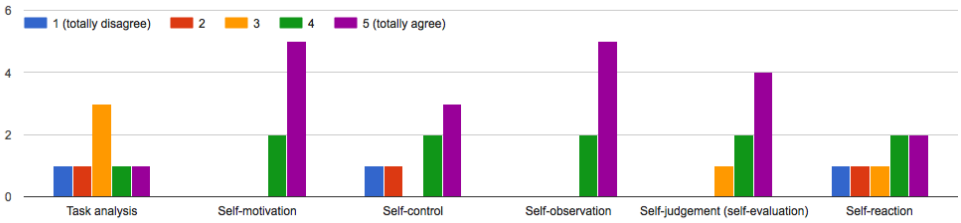


Figure 4. Agreement on the statement:
"Open Badges can help develop the following SRL skills …"

The e-assessment strategy (Figure 5) in the Learning Hub/MOOC seems to be totally aligned with the metacognitive skills in the self-judgement sub-phase (self-reflection phase), with all answers in total agreement. Very similar is the case of the self-observation and self-control sub-phases ranging from levels 3 to 5 of agreement. Disagreement emerges in both sub-phases in the forethought stage and in the final one (self-reaction) with some answers at levels 1 and 2.

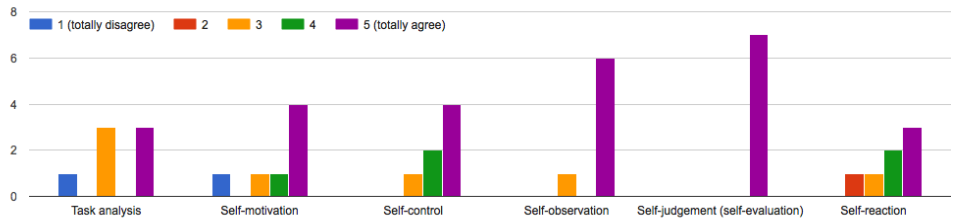


Figure 5. Agreement on the statement:
"E-assessment can help develop the following SRL skills …"

The gamification approach (Figure 6) is only considered totally aligned with SRL for the self-motivation phase (at the forethought phase) and all the others present a wide variety of answers showing differing perceptions among reviewers as there is one negative answer alongside totally positive perceptions by the great majority.

ISBN 978-615-5511-25-7

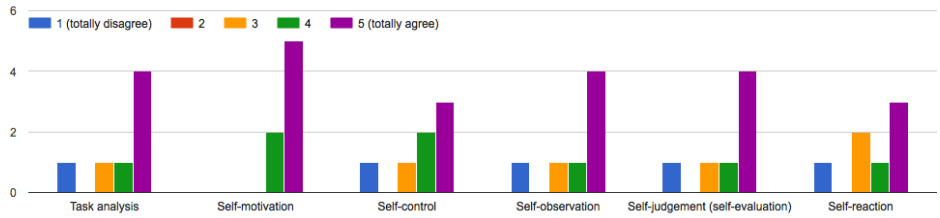


Figure 6. Agreement on the statement:
"Gamification can help develop the following SRL skills …"

The last two tools, skills directory (Figure 7) and the matching tool (Figure 8) present the most unbalanced results with one or two reviewers at all levels of agreement in most sub-phases of the SRL cycle, with the former receiving more answers at level 5 than the latter. So, for the skills directory, in the self-judgment sub-phase, there are 5 reviewers at levels 4 and 5, followed by the self-judgement with 4 reviewers; and, 3 in the self-motivation and self-observation.

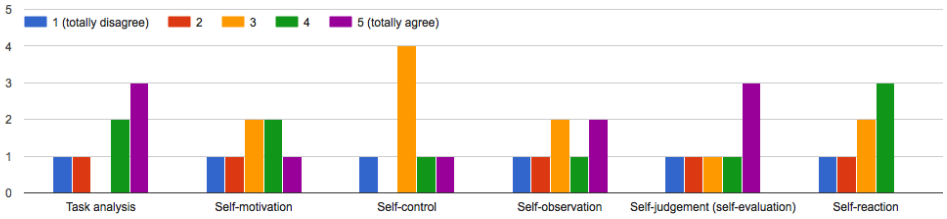


Figure 7. Agreement on the statement:
"The skills directory can help develop the following SRL skills …"

Although for the matching tool there are contradictory perspectives (Figure 8), it can be highlighted that there are 3 reviewers answering at level 4 in the all the sub-phases (except for the self-control that achieves 4 answers), which suggests a relevant alignment for the SRL approach.

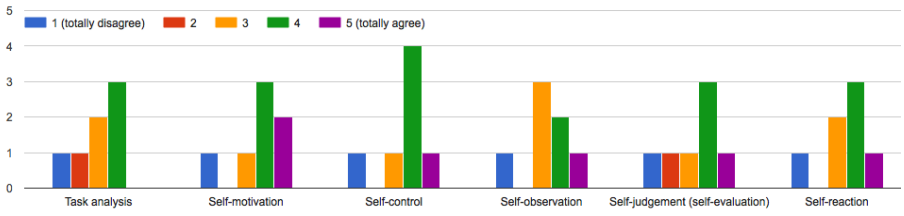


Figure 8. Agreement on the statement:
"The matching tool can help develop the following SRL skills …"

ISBN 978-615-5511-25-7

Discussion and conclusions

The results of the survey point to potentials and challenges in the alignment of the OpenVM project with the SRL cycle. The somehow unbalanced results suggest that some design elements should be modified to enhance SRL. There are elements that are closely related to particular phases of the SRL, as suggested above. However, reviewers seem to feel that although these elements can be theoretically related to SRL, this fact cannot be taken for granted. Thus, the results suggest, that the learning design will be the key element to successfully achieve the SRL as one of the key aims of the project. The assessment of the pilot implementation by external reviewers and target audiences and the following iterations of improvement will show the extent to which the SRL can be achieved as an aim in the OpenVM Erasmus+ project.

References

1. Buchem, I., Konert, J., Carlino, C., Casanova, G., Rajagopal, K., Firssova, O., & Andone, D. (2018). Designing a Collaborative Learning Hub for Virtual Mobility Skills – Insights from the European Project Open Virtual Mobility. In P. Zaphiris & A. Ioannou (Eds.), *Learning and Collaboration Technologies. Design, Development and Technological Innovation* (pp. 1–26). Springer International Publishing AG, part of Springer Nature, LCT 2018, LNCS 10924. https://doi.org/10.1007/978-3-319-91743-6_27
2. Buchem, I., Tur, G., & Urbina, S. (2018, July). *Quality assurance for attainment, assessment and recognition of virtual mobility skills in context of open education. QA Framework in the Open Virtual Mobility project.* Paper presented at Edulearn Conference 2-4 July 2018. Retrieved from https://iated.org/concrete3/view_abstract.php?paper_id=65036
3. Dabbagh, N., & Kitsantas, A. (2012). Personal Learning Environments, social media, and self regulated learning: A natural formula for connecting formal and informal learning. *The Internet and Higher Education, 15*(1), 3–8. doi: 10.1016/j.iheduc.2011.06.002
4. Kane, M., & Trochim, W. M. K. (2007). *Concept mapping for planning and evaluation.* Thousand Oaks, CA: Sage Publications.
5. McKenney, S. & Reeves, T. (2012). *Conducting educational design research.* London: Routledge.
6. Mikroyannidis, A., Connolly, T., Law, E.L-C., Schmitz, H-C., Vieritz, H., Nussbaumer, A., Berthold, M., Ullrich, C., & Dhir, A. (2014). Self-regulated learning in formal education: perceptions, challenges and opportunities. *Int. J. Technology Enhanced Learning, 6*(2), 145–163. doi: 10.1504/IJTEL.2014.066860
7. Open Virtual Mobility (2018). *Project summary.* Retrieved from https://www.openvirtualmobility.eu/about/444-project-summary/
8. Rajagopal, K., Firssova, O., Op de Beeck, I., van der Stappen, E., & Buchem, I. (in preparation).

ISBN 978-615-5511-25-7

9. Reeves, T. (2006). Design research from a technology perspective. In J. V. D. Akker, K. Gravemeijer, S. McKenney & N. Nieveen (Eds.), *Educational design research* (pp. 52–66). New York: Routledge.

10. Ubachs, G., & Henderikx, P. (2018). *EADTU Mobility Matrix.* Maastricht, NL: EADTU. Retrieved from https://tinyurl.com/EADTU-mobility-matrix

11. Zimmerman, B. J. (2002). Becoming a self-regulated learner: An overview. *Theory into Practice, 41*(2), 64-70. doi: 10.1207/s15430421tip4102_2

ISBN 978-615-5511-25-7

Towards Personalized Guidance and Support for Learning
Proceedings of the 10th European Distance and E-Learning Network Research Workshop, 2018
Barcelona, 24-26 October, 2018
ISBN 978-615-5511-25-7

ENHANCING TEACHER DECISIONS THROUGH LEARNING ANALYTICS

Airina Volungevičienė, Vytautas Magnus University, Lithuania, Josep M. Duart, Universitat Oberta de Catalunya, Spain, Giedrė Tamoliūnė, Justina Naujokaitienė, Vytautas Magnus University, Lithuania

Extended abstract for presentation

Learning analytics can be defined as the measurement and collection of extensive data about learners with the aim of understanding and optimising the learning process and environments in which it happens. In the recent decade researchers have started a fundamentally new direction of learning analytics by initially addressing big data (Picciano, 2012), educational data mining (Siemens & Baker, 2012), academic analytics, social learning and action analytics (Ferguson, 2012), as well as issues of student dropouts and ways of increasing student success (Arnold & Pistilli, 2012), with the purpose of developing a method of how learning analytics may enhance teaching and learning (Gasevic, Dawson, & Siemens, 2015). This shift revealed a completely new area of research in education with the prospect of reconsidering ways how learning analytics may contribute to better teaching and learning, addressing, in particular, issues in higher education (Zilvinskis & Borden, 2017) and massive open and online learning.

The research implemented within the framework of the research project "Open and Online Learning for Digitalised and Networked Society" (project No. No. 09.3.3-LMT-K-712-01-0189) funded by the European Social Fund according to the activity "Improvement of researchers" qualification by implementing world-class R&D projects' of Measure No. 09.3.3-LMT-K-712 focused on how learning analytics as a metacognitive tool can be applied for developing a learning analytics method for reflective teacher practice.

The group of researchers builds on the description of learning analytics as a metacognitive tool for teachers as reflective professionals, but also opens new prospects for the investigation of the process of application of learning analytics as a metacognitive method in open and online learning and teaching; on the use of learning analytics data for the implementation of teacher inquiry cycle and reflection on open and online teaching; as well as improvement of curriculum and learning design.

This short overview of the theoretical research adds on to the existing knowledge that teachers have tools that enhance the possibilities to identify learners' behaviour, to track their learning scenarios and to visualise the process of teaching and learning. There are multiple possibilities to enhance learning and teaching for faster, slower, individual or group learning, but we, as professionals, need to re-discuss the practices of the application of these tools in terms of

process and its participants, as well as the impact of their application in teaching and learning. This is the focus of this research: to discuss the application of learning analytics as a metacognitive tool for researching theory and practice, in order to define the principles of the application of learning analytics to enhance our teaching decisions for learning improvement.

From the point of theoretical research review, the process of application of learning analytics as a metacognitive tool in open and online learning and teaching will be presented in the presentation at EDEN Barcelona Research workshop, with the summary of the research implemented in the area, as well as how learning analytics data for the implementation and reflection of teachers' inquiry cycle (adapted by Sergis, Sampson, & Pelliccione, 2017) in open and online teaching are used. Theoretical analysis will be concluded with the observations how learning analytics data analysis is important for curriculum and learning design improvement.

Theoretical research results have been further validated with the empirical research based on semi-structured interviews used to collect the data. The results of the research, the discussion and the conclusions, as well as further research ideas will be presented in oral presentation, if accepted, in EDEN Research workshop.

The conclusions of the research will demonstrate that teachers as reflective professionals should understand different learning habits of their students, recognize learners' behaviour, understand their thinking capacities, willingness to engage in the course etc., and based on this information, make real time adjustments to their course curriculum.

Metacognition could be seen through different perspectives in this case: first, how teachers use learning analytics for a better understanding of students' learning process; second, how we as teachers evaluate our own activities, how we design our work - which leads us to learning analytics as an indicator for a deeper learning process understanding.

References

1. Arnold, K. E., & Pistilli, M. D. (2012). Course Signals at Purdue: using learning analytics to increase student success. *Proceedings from the 2nd International Conference on Learning Analytics and Knowledge.* doi: 10.1145/2330601.2330666
2. Ferguson, R. (2012). Learning analytics: drivers, developments and challenges. *International Journal of Technology Enhanced Learning, 4*(5-6), 304-317.
3. Gasevic, D., Dawson, S., & Siemens, G. (2015). Let's not forget: Learning analytics are about learning. *TechTrends, 59*(1), 64-71
4. Picciano, A. G. (2012). The evolution of big data and learning analytics in American higher education. *Journal of Asynchronous Learning Networks, 16*(3), 9-20.
5. Sergis, S., Sampson, D., & Pelliccione, L. (2017). Investigating the impact of Flipped Classroom on students' learning experiences: A Self-Determination *Theory approach. Computers in Human Behaviour, 78*(1), 368-378.

ISBN 978-615-5511-25-7

6. Siemens, G., & Baker, R. S. J. (2012). *Learning analytics and educational data mining: towards communication and collaboration.* Paper presented at the Proceedings of the 2nd International Conference on Learning Analytics and Knowledge. doi: 10.1145/2330601.2330661
7. Zilvinskis, J., & Borden, V. (Eds.) (2017). *Learning analytics in higher education.* USA: The Sheridan Press.

ISBN 978-615-5511-25-7

Towards Personalized Guidance and Support for Learning
Proceedings of the 10th European Distance and E-Learning Network Research Workshop, 2018
Barcelona, 24-26 October, 2018
ISBN 978-615-5511-25-7

DEVELOPING A FRAMEWORK OF E-LEADERSHIP LITERACIES FOR TECHNOLOGY-ENHANCED LEARNING IN HIGHER EDUCATION: A DELPHI STUDY

Deborah Arnold, Albert Sangrà, Universitat Oberta de Catalunya, Spain

Summary

This paper presents the results of a Delphi study conducted as part of a doctoral research project on e-leadership literacies for technology-enhanced learning (TEL-eLL) in higher education (HE). The aim of the Delphi study is to answer the research question: "What are TEL-eLL?" In other words, how can we define the novel concept of TEL-eLL and how can we formulate the specific e-leadership literacies for TEL in the form of a meaningful framework.

After situating the research with respect to prior work on Leadership Literacies and e-leadership for TEL, the paper gives a detailed account of the design and results of the Delphi study conducted early 2018. Plans for further research applying the TEL-eLL framework are also outlined.

Introduction

The rationale behind the overall study is anchored in the still unsatisfactory integration of technology for teaching and learning in higher education (HE) and the hypothesis that one of the reasons for this is a lack of strategic thinking and leadership (Bates & Sangrà, 2011). The aim is thus to explore the attitudes, mindsets, understandings and behaviours of higher education decision-makers in relation to teaching and learning supported by technology, as well as their wider views on the societal and environmental impact of technology. The research is organised in three phases, the first of which, defining a framework of e-leadership literacies for technology-enhanced learning (TEL-eLL), is the focus of this paper. The following two phases involve applying this framework in three Mixed Methods case studies in European campus-based universities and analysing Leadership Development Programmes (LDPs) with the ultimate aim of formulating a series of recommendations to support universities in their integration of technology for teaching and learning.

The starting point for this study was to take the concept of Leadership Literacies as developed by Davis (2012) in order to explore how these could apply to TEL leadership, with particular reference to a framework for e-leadership for Technology-Enhanced Learning in Higher Education (Jameson, 2013). In order to validate both the definition and the content of the resulting novel concept of TEL-eLL an online Delphi study was carried out in three rounds between January and March 2018.

Methodology

Delphi studies are frequently used in research designed to develop competency frameworks, for example to identify leadership competencies for library directors and senior managers (Lewis, 2015) or skills for virtual team leaders (Whited, 2007).

The Delphi method originated in the 1950s (Dalkey & Helmer, 1963) as a means for reaching consensus among a group of experts, enabling anonymity of individual responses, revision of contributions by individuals and assessment of the group view (Linstone & Turoff, 1975; Pawlowski & Okoli, 2004). The Delphi method is of particular interest to research where judgmental information is indispensable (Pawlowski & Okoli, 2004). This is precisely the case here, where the proposed combination of Davis' (2012) leadership literacies and Jameson's (2013) e-leadership framework for TEL requires validation before commencing the following stages. Furthermore, mobilisation of external experts also minimises researcher bias (Lincoln & Guba, 1985).

Due to the iterative nature of Delphi studies through the successive rounds, the following sections present the different stages of the Delphi design as they took place, taking a chronological perspective in order to demonstrate how the analysis of each round informed the design of the following round.

Delphi Study design

Selection and invitation of experts

A total of 113 international experts were identified and invited from within the researchers own extensive networks and from key publications in the field of leadership for TEL in HE. The criteria for the selection of the experts were: significant knowledge and/or experience of (TEL) leadership in HE, knowledge of TEL in particular from a pedagogical rather than a technical perspective, coverage of both ODL and campus-based HE contexts, gender balance of the overall panel. A short document containing the theoretical background and rationale was prepared for the experts, who were contacted individually by email or via LinkedIn. Follow-up emails were sent to a number of those experts initially contacted via LinkedIn when a much lower response rate was noted in this group, suggesting that this channel, although providing a quick way of reaching out to people, was not particularly effective. At the end of the invitation process, 48 experts had agreed to participate, representing a response rate of 42.48%. 10 experts (8.85%) declined the invitation. 55 experts (48.67%) did not respond to the invitation.

Round 1: Survey design

While Delphi studies traditionally begin by eliciting proposals from experts in the first round, Hsu and Sandford (2007) note that "it is both an acceptable and a common modification of the Delphi process format to use a structured questionnaire in Round 1 that is based upon an extensive review of the literature." (Hsu & Sandford, 2007; p.2). This was thus the approach taken for the TEL-eLL Delphi study described here.

ISBN 978-615-5511-25-7

The aim of Round 1 was to:

- submit a working definition of TEL-eLL to experts in order to validate or refine it,
- ask experts to rate a series of 68 statements derived from the literature,
- ask experts to suggest improvements to the proposed statements,
- ask experts to suggest statements of their own to complete the framework.

In the first question, experts were thus asked whether they found the proposed working definition perfectly satisfactory, reasonably satisfactory or unsatisfactory.

The working definition of TEL-eLL presented to the Delphi experts was the following:

> *"a set of attitudes, understandings and mindsets which enable leaders in higher education to address complex problems relating to the integration of technology-enhanced learning and to solve them in ways which are respectful of people and the environment and which contribute to socio-economic development and to developing the capacity for social awareness and critical reflection (within and beyond the institution) as a basis for personal and social change."*

Those who answered *reasonably satisfactory* or *unsatisfactory* were then asked to propose a reformulation. This question was repeated at the end of the questionnaire, to enable experts to revise their proposed reformulation after gaining better knowledge of the framework and its contents through completing the survey.

For the second part of the first round, a provisional TEL-eLL framework was developed based on Davis' (2012) Leadership Literacies for professional staff in universities, which provides the overarching dimensions, and Jameson's (2013) e-leadership framework for TEL (see Table 1). Other work which informed this included Johansen's (2012) leadership skills for an uncertain world, Sheninger's (2014) seven pillars of digital leadership, Belshaw's (2014) digital literacies, Ahlquist's (2014) ten competencies of a digital leader, Beaudoin's (2016) recommendations for distance education decision makers in HE, the work of the C-DELTA project in developing a curriculum for Digital Education Leadership (Brown, Czerniewicz, Huang, & Mayisela, 2016), Appreciative Leadership (Orr & Cleveland-Innes, 2015). Some of the original definitions were modified slightly to adapt them to the specific context of TEL or to align them with the notion of literacies, and so some evolution of their initial meaning was unavoidable.

This resulted in 68 literacy statements, which experts were asked to rate on a 5-point Likert scale from 1 = *highly important* to 5 = *not at all important*. They were encouraged to think of a governance-level TEL leader that they knew (or to think of themselves if they held or had held such a position) in order to situate these literacies in real-world practice. All rating questions were mandatory. An optional text response was provided to give experts the opportunity to suggest an improved formulation for each statement. At the end of each dimension or sub-

ISBN 978-615-5511-25-7

dimension, experts were given the option of proposing new statements. The final resulting questionnaire consisted of 149 questions, 70 of which were mandatory. Pre-testing of the questionnaire suggested a required completion time of 45 minutes for someone unfamiliar with the framework.

Round 1: Data analysis

TEL-eLL definition

21.1% of experts found the proposed working definition perfectly satisfactory. 68.4% found it reasonably satisfactory. 10.5% found it unsatisfactory. A total of 21 reformulations were proposed, 14 of which were considered to be adjustments to the initial definition (changing words and punctuation, omitting words and phrases). The remaining 7 were considered to be major rewording or alternative definitions.

Calculating consensus for the statements

Determining consensus in Delphi studies can be done in several ways, with studies often setting arbitrary consensus thresholds such as 50% in the first round and a higher threshold in subsequent rounds (von der Gracht, 2012). For the first round, Average Percentage Majority Opinion (APMO) was used, where:

> *AMPO = (total number of majority agreement + majority disagreement)/total number of opinions expressed x 100%*

Majority agreement was set at 50% for *highly important* + *important* on the Likert scale. Majority disagreement was set at 50% for *not important* + *not at all important*. All statements passed the majority agreement threshold.

The total number of majority agreements was 2160. The AMPO consensus threshold was thus calculated as:

> *(2160+0)/2583 x 100% = 83.7%*

Consensus was thus considered to have been reached on all statements receiving an agreement score of >83.7%.

Overall, by using AMPO, consensus was reached on 39 of the 68 statements (57.35%) in Round 1. These statements were thus considered to have been validated for the final framework, although reformulations still needed to be evaluated by the experts in Round 2. Those statements on which consensus had not been reached were resubmitted in Round 2 for validation, in the initial wording or with a proposed reformulation, or for exclusion from the framework.

ISBN 978-615-5511-25-7

Round 2: Survey design

TEL-eLL definition

The 21 reformulations were classed into the two categories of adjustments and major rewordings. For the 14 adjustments to the initial definition, bold typeface and barred text were used to indicate where these changes had been made. Experts were asked to choose their top three definitions: first choice, second choice, third choice.

Statements

For statements which achieved consensus in Round 1 but for which reformulations were proposed, experts were asked either to validate the initial definition or choose one of the reformulations. For statements which did not achieve consensus in Round 1, experts were asked to validate the initial definition, choose one of the proposed reformulations or eliminate the statement from the framework. For the new proposed statements in Round 1, experts were asked to rate these on a 5-point Likert scale as in Round 1. Optional text responses were included at the end of each dimension/sub-dimension for experts to explain their choice, and a final optional text response provided at the end of the survey. In order to support the aim of reaching consensus by the end of Round 3, no new statements were solicited. The resulting questionnaire for Round 2 consisted of 133 questions, 13 of which were optional text responses.

Round 2: Data analysis

TEL-eLL definition

A score of 3 was attributed to definitions selected as first choice. A score of 2 was attributed to definitions selected as second choice. A score of 1 was attributed to definitions selected as third choice. The top 4 definitions (A, C, D and O, presented in Table 1 below) were selected for inclusion in Round 3.

Table 1: The top 4 definitions resulting from Round 2 of the TEL-eLL Delphi study

ID	Definition	Score (Round 2)
(A)	"a set of attitudes, understandings, mindsets and visions which enable leaders in higher education to employ sound judgment for making consistently good decisions for addressing complex problems relating to the integration of technology-enhanced learning and to solve these problems in ways which are respectful of people and the environment; and which contribute to socio-economic development and enhancing the capacity for individual social awareness and critical reflection (within and beyond the institution) as a basis for personal and social change."	18
(C)	"a set of attitudes, understandings and mindsets, including an awareness of how technology changes the traditional paradigms of education, research, scholarship and administration. TEL-eLL should enable leaders in higher education to address complex problems relating to the integration of technology in education, and to solve them in ways which are respectful of people and the environment and which contribute to socio-economic development and to developing the capacity for social awareness and critical reflection (within and beyond the institution) as a basis for personal and social change."	24
(D)	"a set of attitudes, understandings and mindsets which enable leaders in higher education to address complex problems relating to the integration of technology-enhanced learning."	20

ISBN 978-615-5511-25-7

(O)	"a set of attitudes, understanding, and mindsets that empower leaders in higher education with skills to practice foresight, insight, and action to address complex problems in relation to the integration of technology-enhanced learning."	16

Statements and reformulations

At the end of Round 2, consensus was reached on 66.67% of the new statements that experts had proposed in Round 1. Three of the original statements were also validated outright, the others being reformulations which resulted in a significant dispersion of responses. This raises the issue of the complexity of this study, with experts being able to introduce nuance and additional ideas, rather than being driven towards a 'forced' consensus by the nature of the study itself.

Round 3: Survey design

TEL-eLL definition

The top 4 definitions (A, C, D and O) were put to experts again, with the option of not aligning with the consensus, on condition that they justified their choice.

Statements

The Round 3 survey included only the statements which did not achieve consensus in Round 2. For each statement, experts were presented with the results from Round 2 in graph form. To avoid dispersion of the answers in Round 3, only the reformulations which achieved a score of >20% were included, while leaving experts the option of choosing "other" so as not to force their hand. This questionnaire consisted of 89 obligatory questions.

Overall results

Forty-eight (42.48%) of those contacted signed up for the Delphi study and thirty-eight (79%) of these actually completed Round 1. Of these thirty-one (82%) completed both Rounds 2 and 3. This represents a reasonable response rate at sign-up stage, and an excellent rate of Round 1 participation compared to sign-up, as well as an excellent continuation rate, helped by regular polite reminders and a certain amount of flexibility accorded to experts who requested an extension of the deadline. In particular, for the validity of the study, it was important that all those who contributed in Round 2 also completed the final round.

TEL-eLL definition

The final result was an absence of any clear-cut consensus, but which favoured the most concise, general definition of TEL-eLL (D = 41.9%) as "a set of attitudes, understandings and mindsets which enable leaders in higher education to address complex problems relating to the integration of technology-enhanced learning". Furthermore, referring back to Table 1, we can see that the second-choice definition (C), which obtained a score of 32.3% in Round 3, actually includes Definition D. It is thus important to both retain a workable, understandable general definition (D), while taking care not to neglect the additional issues addressed by nearly one third of the experts, namely: "an awareness of how technology changes the

ISBN 978-615-5511-25-7

traditional paradigms of education, research, scholarship and administration; and solving these problems in ways which are respectful of people and the environment and which contribute to socio-economic development and to developing the capacity for social awareness and critical reflection (within and beyond the institution) as a basis for personal and social change."

TEL-eLL framework

The final overall framework consists of 69 statements, with 4 of the original and 6 of the new statements having been eliminated. The structure of the framework including the number of statements and the main themes addressed within each of the dimensions or sub-dimensions is presented in Table 2 below.

Table 2: Summary of TEL-eLL framework

DIMENSION	SUBDIMENSION	MAIN THEMES
WORLDLY (29)	e-leadership visioning (13)	Informed decision making; Clear vision of institutional mission; Creating an open and respectful environment for discussion; Involving external stakeholders.
	Self-relationship with technology (9)	Healthy embracing of digital technologies; Ethics, cybersecurity; Critical digital literacy; Awareness of research on student use of media.
	Self-relationship with teaching and learning (7)	Understanding different learning theories and approaches; Design thinking for pedagogy; Affordances and potential risks of TEL.
SUSTAINING (8)		Human and environmental implications; Access, equity and inclusion; Safe, legal and ethical use of TEL; Learning spaces; Social good, digital citizenship, open education.
LEADINGFUL (15)	Leadership style (13)	Creating conditions for innovation and change; Risk-taking; Change management; Distributed leadership, empowering others.
	Branding and Public Relations (2)	Promoting open forms of education; Positive brand image emphasising the quality of teaching and learning supported by technology.
RELATIONAL (10)		Shared vision, meaning and purpose; Managing relationships; Trust, positive affect and caring; Managing divergences and differences, while still being able to make a decision in the absence of consensus.
LEARNINFUL (7)	Leader as learningful self (4)	Formal and informal learning for leadership, change management, information literacy and critical digital literacy; Learning the art of delegation.
	Learningful	Reward mechanisms aligned with competencies for

ISBN 978-615-5511-25-7

community (3)	change; Digital scholarship (teacher and staff development); Organisational culture of learning and innovation.

Conclusion

This paper describes Phase 1 of a wider research study, which entailed developing a TEL-eLL framework via a Delphi study in three rounds. This framework is applied in the three Mixed Methods Case Studies which form Phase 2 of the research, exploring the lived experiences of key informants in three European campus-based universities with respect to TEL leadership. The framework is also applied in Phase 3, to analyse existing leadership development programmes and to develop recommendations for the explicit integration of TEL-eLL in future programmes.

References

1. Ahlquist, J. (2014). Trending now: Digital Leadership Education using Social Media and the Social Change Model. *Journal of Leadership Studies, 8*(2), 57–60. https://doi.org/10.1002/jls
2. Bates, A. W. (Tony), & Sangrà, A. (2011). *Managing technology in higher education: Strategies for transforming teaching and learning.* John Wiley & Sons.
3. Beaudoin, M. (2016). Issues in Distance Education: A Primer for Higher Education Decision Makers. *New Directions for Higher Education, 173*, 9–19. https://doi.org/10.1002/he
4. Belshaw, D. (2014). *The Essential Elements of Digital Literacies.* https://doi.org/10.1007/s13398-014-0173-7.2
5. Brown, C., Czerniewicz, L., Huang, C.-W., & Mayisela, T. (2016). *Curriculum for Digital Education Leadership: A Concept Paper.* Retrieved October 30, 2017, from http://oasis.col.org/handle/11599/2442
6. Dalkey, N., & Helmer, O. (1963). An Experimental Application of the Delphi Method to the Use of Experts. *Management Science (Pre-1986), 9*(3), 458–467.
7. Davis, H. (2012). *Leadership Literacies for Professional Staff in Universities.* RMIT University. Retrieved from https://researchbank.rmit.edu.au/view/rmit:160335
8. von der Gracht, H. A. (2012). Consensus measurement in Delphi studies. Review and implications for future quality assurance. *Technological Forecasting and Social Change, 79*(8), 1525–1536. https://doi.org/10.1016/j.techfore.2012.04.013
9. Hsu, C.-C., & Sandford, B. A. (2007). The Delphi technique. *Practical Assessment, Research & Evaluation, 12*(10), 1–8. https://doi.org/10.1576/toag.7.2.120.27071
10. Jameson, J. (2013). E-Leadership in higher education: The fifth "age" of educational technology research. *British Journal of Educational Technology, 44*(6), 889–915.

ISBN 978-615-5511-25-7

11. Johansen, R. (2012). *Leaders make the future: Ten new leadership skills for an uncertain world* (2nd ed.). San Francisco, CA: Berrett-Koehler Publishers.
12. Lewis, J. (2015). *The Academic Library in the 21st Century: Competencies Library Directors and Senior Managers Must Possess to Successfully Lead Their Organizations into the Future.*
13. Lincoln, Y. S., & Guba, E. G. (1985). *Naturalistic inquiry* (Vol. 75). Sage.
14. Linstone, H. A., & Turoff, M. (1975). *The Delphi method: Techniques and applications* (Vol. 29). Addison-Wesley Reading, MA.
15. Orr, T., & Cleveland-Innes, M. (2015). Appreciative leadership: Supporting education innovation. *International Review of Research in Open and Distributed Learning, 16*(4), 235–241.
16. Pawlowski, S. D., & Okoli, C. (2004). The Delphi Method as a Research Tool: An Example, Design Considerations and Applications. *Information & Management, 42*(1), 15–29. https://doi.org/10.1016/j.im.2003.11.002
17. Sheninger, E. (2014). *Digital Leadership: Changing Paradigms for Changing Times.* Thousand Oaks, CA: Corwin, Sage Publications.
18. Whited, J. E. (2007). *Identifying required skills for virtual team leaders: A Delphi method study.* University of Phoenix.

ISBN 978-615-5511-25-7

Towards Personalized Guidance and Support for Learning
Proceedings of the 10th European Distance and E-Learning Network Research Workshop, 2018
Barcelona, 24-26 October, 2018
ISBN 978-615-5511-25-7

LEARNER AGENCY AND THE "SELF"-PEDAGOGIES

Lisa Marie Blaschke, Carl von Ossietzky Universität Oldenburg, Germany

Summary

As a result of the rising popularity of learner-centred teaching and learning, interest has generated into established educational pedagogies that have focused on supporting learner agency. These pedagogies – referred to the "self" pedagogies in this paper – include theories of teaching and learning such as self-efficacy, self-determination, and self-directed (andragogy), self-regulated, and self-determined (heutagogy) learning. This paper describes learner agency and the "self" pedagogies, while also identifying ways in which these pedagogies can be used to promote learner agency in the online classroom.

Introduction

Within education, there has been renewed interest in learner-centred teaching and learning such as humanism and learner agency. Maslow (1943) believed that humans have an innate desire to achieve a state of self-actualization throughout their lives, that is the "working out of one's own fundamental personality, the fulfilment of its potentialities, the use of its capacities, the tendency to be the most that one is capable of being" (Loc 908). Another strong proponent of humanism, Rogers (1961) found that human beings have a natural propensity to learn, and he encouraged placing the learner at the centre of the education process, going so far as to suggest the elimination of grades, credits, examinations, and even teachers. Emerging from the tenets of humanism have been other learner-centred pedagogies that support and promote learner agency such as self-efficacy, self-determination, and self-directed (andragogy), self-regulated, and self-determined (heutagogy) learning. This paper provides an overview of learner agency and the "self" pedagogies, as well as describes practical approaches for applying them in online and distance learning (ODL).

Learner Agency

Learner agency is closely related to Maslow and Rogers' views of humanism and learner agency. Bandura (2001) describes learner agency as follows:

> *"To be an agent is to intentionally make things happen by one's actions. Agency embodies the endowments, belief systems, self-regulatory capabilities and distributed structures and functions through which personal influence is exercised, rather than residing as a discrete entity in a particular place." (p.2).*

According to Bandura (2001), human agency is characterized by: intentionality (activity that will be performed in the future), forethought (considering what could happen as a

consequence of an action), self-reactiveness (beliefs and self-efficacy that guide the action and what and how it will be performed), and self-reflectiveness (examining and reflecting upon the consequences and meaning of actions). Bandura (2001) underscored the importance of learner agency, stating that

> *"people are not just onlooking hosts of internal mechanisms orchestrated by environmental events. They are agents of experience rather than simply undergoers of experience…The human mind is generative, creative, proactive, and reflective, not just reactive." (p.4)*

The "Self-Pedagogies"

Self-Efficacy

The first "self" pedagogy to be described here is self-efficacy. While efficacy is the ability to achieve a specific outcome or outcomes, self-efficacy is one's belief in or perception of his/her ability to achieve that outcome (Bandura, 1977). How a learner perceives individual self-efficacy depends upon the learner's view of his/her abilities, which can be based upon factors such as "personal accomplishments and failures, seeing others who are seen as similar to oneself succeed or fail at various tasks, and verbal persuasion" (Olson & Hergenhahn, 2009; p.338). In addition, perceived self-efficacy does not always equate to actual self-efficacy, meaning that learners can perceive themselves as having high efficacy, but, in reality, have a low efficacy and vice versa (Bandura, 1977).

Bandura (2001) believed that a learner's perception of his/her self-efficacy influenced learning behaviour and the learner's intention to learn and that this learner perception created an environment of intrinsic reinforcement, where those "with high perceived self-efficacy try more, accomplish more, and persist longer at a task than those with low perceived self-efficacy" (Olson & Hergenhahn, 2009; p.338). At the same time, those with a low perceived self-efficacy are less intentional or confident in their learning behaviour (Bandura, 1977). In this way, a learner's perception of his/her self-efficacy can influence and even restrict learning, by determining the level of effort learners will expend and their persistence when confronted with adversity (Bandura, 1977).

According to Bandura (1977), the development of self-efficacy is based on four sources:

- Performance accomplishments, or the experience of mastering a task or activity through both successes and failure.
- Vicarious experience, or observing others achieve in adverse conditions and with positive results.
- Verbal persuasion, or receiving positive input regarding one's ability to perform.
- Emotional arousal, or experiences performing successfully in highly stressful situations that emit an emotional response.

Bandura (1977) further argues that for learner perception of and change in self-efficacy to be sustainable, learners must be capable of mastering activities in a self-directed way; this self-

ISBN 978-615-5511-25-7

direction exposes learners to potential threats, helps improve coping skills in challenging situations, and can result in positive experiences of success.

Self-Determination

The next "self" pedagogy to be described here is Deci and Ryan's theory of self-determination (Deci et al., 1994; Deci & Ryan, 2002). In their theory, Deci and Ryan (2002) describe individuals as having a desire for ongoing self-development both autonomously (through self-regulation) and in relationship to others (within social contexts). The theory identifies three central needs – "competence, relatedness, and autonomy" – that encompass the human desire for self-development and is based in four mini-theories: cognitive evaluation theory, organismic integration theory, causality orientations theory, and basic needs theory (p.6). Table 1 provides a summary of each of these mini-theories.

Table 1: Overview of Deci and Ryan's (2002) mini-theories within self-determination theory.

Mini-Theory	Description
Cognitive evaluation theory (CET)	Considers the role of intrinsic motivation within the social context, where two forms of cognitive processing influence one's intrinsic motivation: (a) perceived locus of causality, where the perception that change results from external influences (less intrinsic motivation) or from more internally and individual loci (more intrinsic motivation); and (b) perceived competence, or the sense that individuals feel more competent as a result of an action such as positive feedback. When motivated by reward, an individual's intrinsic motivation is decreased, whereas factors such as learner autonomy and self-regulation, social context (contact and relatedness), empathy, and positive feedback support growth of intrinsic motivation, but only when individuals have a personal sense of achieved competency (Deci & Ryan, 2002; Wagner & French, 2010).
Organismic integration theory (OIT)	Considers various types of motivation – amotivation, extrinsic, and intrinsic – and their potential for influencing integration and internalization of regulation (or regulated behaviour). Deci and Ryan (2002; Deci et al., 1994) refer to this internalization process as a continuum, moving from amotivation to extrinsic motivation and finally to intrinsic motivation. Learner regulation moves similarly along the continuum, from non-regulation to external regulation and then intrinsic regulation, while behaviour shifts from non-self-determined to fully self-determined. Along the continuum, individuals progress from a state of inaction (or lack of desire to act) to acting as a result of external forces (or regulation) that exercise punishment or reward when learners act. The end of the continuum has individuals identifying with, integrating, and then internalizing regulation of their actions with their value and belief systems and entering into a state where they regulate their actions intrinsically (Deci & Ryan, 2002).
Causality orientations theory (COT)	Focus is on the internalization of motivational factors from an extrinsic motivational perspective and in regard to the influence of social contexts. Deci and Ryan (2002) identify three types of causality orientations: autonomy, controlled, and impersonal. Within autonomy orientation conditions, the individual regulates his or her reaction to extrinsic motivational factors based on his/her inner values and beliefs, i.e., self-regulation. Within controlled orientation conditions, individuals orient themselves to factors that influence expected behaviour patterns (e.g., how they are expected to behave), i.e., external regulation.

ISBN 978-615-5511-25-7

Basic Needs Theory	Considers the role of goals in achieving personal well-being. These goals can be either (a) intrinsic, directly satisfying basic needs such as personal growth and development, or (b) extrinsic, peripherally satisfying basic needs established by external forces, needs such as wealth reputation. Citing research from Kasser and Ryan (1993, 1996), Deci and Ryan (2002) find that intrinsic goals contribute more positively to personal well-being than extrinsic goals, which can have negative effects such as depression and stress, and by placing greater priority on extrinsic goals over intrinsic goals, individuals can suffer from inferior well-being. Reeve (2002) and Deci et al. (1994) argue that the more autonomous a student is allowed to be, the more engaged she or he is in the learning process.

Self-Directed Learning

Another "self" pedagogy highly relevant within the tradition of ODL is that of self-directed learning, or andragogy. The concept of andragogy was made popular by Malcolm Knowles (1975) and stems from the belief that teaching and learning approaches for adults should be fundamentally different from those for children. His ideas are based on the view that the more mature a learner becomes, the more self-directed the learner will be in his or her own learning. Knowles (1975) defined andragogy 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 learning strategies, and evaluating learning outcomes." (p.18)*

As a holistic, learner-centred model, andragogy is comprised of the following six principles:

1. *Learner's need to know:* Adult learners want to decide what will be learned, and when and how it will be learned.
2. *Self-concept of the learner:* Adult learners want to plan and direct their learning.
3. *Prior experience of the learner:* Adult learners have a wide range of past experiences to draw from in understanding and applying what they learn.
4. *Readiness to learn:* Adult learners want to understand the relevance of what they are learning to them and to their environment.
5. *Orientation to learning:* Adult learners prefer a problem-centred approach to learning.
6. *Motivation to learn*: Adult learners are internally, rather than externally, motivated to learn (Knowles, Swanson, & Holton, 2011; p.3)

Knowles (1975) advocated choice, flexibility, and autonomy for adult learners and encouraged various kinds of learner support (tutoring, advising, counselling) that was meant to personalize and individualize an otherwise uniform system of education. Andragogy is similar to self-determination, as it "assumes that learners are motivated by internal incentives, such as the need for esteem (especially self-esteem), the desire to achieve, the urge to grow, the satisfaction of accomplishment, the need to know something specific, and curiosity" (Knowles, 1975; p.21). Knowles' theory (1975) also embraces the value of lifelong learning,

ISBN 978-615-5511-25-7

defining education as a lifelong process, necessary not only for the individual but society as a whole.

Andragogy is practically synonymous with learner-managed learning, which Long (1990) describes as learning where "the learner takes responsibility for decisions as to what is being learned and the means by which learning is to take place" (p.37). Boud and Higgs (1993) expand further upon Long's ideas about learner-managed learning, describing it as a situation where the learner does not learn in isolation and where "learning can take many different forms within which a number of phases and a variety of learner behaviours occur" (p.159). Lifelong learning is also a central tenet of learner-managed learning (Boud & Higgs, 1993).

Self-Regulated Learning

Self-regulated learning is another of the "self" pedagogies. In self-regulated learning, "students are self-regulated to the degree that they are meta-cognitively, motivationally, and behaviorally active participants in their own learning process…students monitor the effectiveness of their learning methods or strategies and respond to this feedback" (Zimmerman & Schunk, 2001; p.5). The focus of self-regulated learning is primarily on the ability of students to monitor their learning effectiveness and to then adapt their learning approach and process accordingly, depending on the learning context, thereby enhancing their learning skills. Bandura (2001) reported that much learner behaviour is self-regulated, primarily learned through observation and comparing behaviour established performance guidelines or standards: "If one's behavior meets or exceeds one's performance standards, it is evaluated positively; if it falls short of one's standards, it is evaluated negatively. Likewise, one's perceived self-efficacy develops from one's direct and vicarious experiences with success and failure." (Olson & Hergenhan, 2009; p.354). According to Zimmerman and Schunk (2001), theorists identify the following general assumptions about self-regulated learning:

> *"SRL theories assume that students (a) can personally improve their ability to learn through selective use of metacognitive and motivational strategies; (b) can proactively select, structure, and even create advantageous learning environments; and (c) can play a significant role in choosing the form and amount of instruction they need." (p.5)*

Zimmermann and Schunk (2001) also argue that a definition of self-regulated learning is characterized by and dependent upon: (a) the researcher's theoretical perspective (operant, phenomenological, information processing, social cognitive, volitional, Vygotskian, constructivist); (b) the feedback loop used by the learner to assess effectiveness of his/her learning approach; and (c) a description of the approach used by the learner and why it was chosen. Common characteristics or issues present within self-regulated learning include: student motivation to self-regulate (motivation); process the occurs as students become self-regulated (self-aware); process(es) students use to achieve learning outcomes (key processes); ways in which environment influences the self-regulated learning approach (social and

ISBN 978-615-5511-25-7

physical environment); and ways in which learners become capable of self-regulating their learning (acquiring capacity).

Self-Determined Learning (Heutagogy)

Learner agency is at the centre of heutagogy and underlies and permeates each aspect of the theory. As heutagogy places the student at the centre of the learning experience, the theory is closely aligned with a humanistic educational approach where the learner is the agent of his/her learning. Within heutagogy, students are encouraged to take responsibility for the learning design and pathway, while instructors are meant to facilitate learning and to encourage learner action and experience in a supportive, non-threatening environment (Hase & Kenyon, 2000). Basic principles of heutagogy include: learner agency and autonomy, self-reflection and metacognition (double-loop learning), self-efficacy and capability, and non-linear teaching and learning (Blaschke, 2012; 2016a).

Heutagogy (self-determined learning) is often used interchangeably with andragogy (self-directed learning) and might best be understood as an extension of andragogy. Luckin et al (2010) and Garnett (2013) propose a pedagogy-andragogy-heutagogy (PAH) continuum, where they describe pedagogy as child-leading, andragogy as adult-leading, and heutagogy as self-leading and state that the value in a selected approach is in understanding a subject (pedagogy), understanding the learning process (andragogy), or understanding both within context (heutagogy). Blaschke (2012) builds on the idea of a PAH continuum further in describing the learner as moving from a more structured, less autonomous educational environment to an environment of higher autonomy with little or no structure. Key differences of the three approaches are briefly presented in the following table (Table 2).

Table 2: Heutagogy as a continuum of pedagogy and andragogy (Blaschke, 2016b)*

Pedagogy (Teacher-directed)	Andragogy (Self-directed)	Heutagogy (Self-determined)
Some single-loop learning	Stronger emphasis on single-loop learning	Single and double-loop learning
Knowledge transfer and acquisition	Competency development	Capability development
Linear design of courses/curriculum and instructor-directed teaching approach	Linear design of courses/curriculum with learner-directed learning approach (e.g., organizing his/her learning)	Non-linear design and learner-determined learning approach
Instructor-directed	Instructor-learner directed	Learner-determined
Getting students to learn (content)	Getting students to learn (content)	Getting students to understand how they learn (process)

* See also Blaschke (2012), as well as Kanwar, Balasubramanian, and Abdurrahman (2013) Table 1: Three approaches in learning for an expanded description (p.23).

Self-determined learning and self-determination are also often used interchangeably within the literature, although the two theories are not the same. Heutagogy includes important aspects of Deci & Ryan's theory of self-determination, such as learner autonomy, intrinsic and

ISBN 978-615-5511-25-7

goal-setting motivation, self-regulation, and self-efficacy; however, heutagogy incorporates other principles – such as self-reflection and meta-cognition, double-loop learning, learner competency and capability, and non-linear learning and teaching – that are not included in Deci and Ryan's theory (Blaschke, 2012; Blaschke & Hase, 2015).

Like self-regulated learning, heutagogy incorporates elements of self-actualization, self-efficacy, self-monitoring and observation, self-assessment, self-instruction, and self-evaluation. However, self-determined learning is different from self-regulated learning, in that (a) instructors do not direct student learning and what will be learned; and (b) modelling and reinforcement (e.g., of instructor, other learners) is not a core characteristic of self-determined learning (Blaschke, 2016b; Zimmermann & Schunk, 2001). If placed within the PAH continuum in Table 1 above, self-regulated learning would most likely fall between andragogy and heutagogy – more self-actualized and self-defined than self-directed learning but not as fully autonomous as self-determined learning (A comprehensive literature review that compares self-directed, self-regulated, and self-determined learning is lacking in the current literature and is an area of potential future research.).

The "Self"-Pedagogies in Practice

As educators, how can we apply the "self"-pedagogies in practice in order to support and promote learner agency? Here are a few ideas:

- Self-efficacy: incorporate learner-directed questions and problem-solving activities, allow for room for failure, scaffold the learning process, provide positive and formative feedback, and ensure there are opportunities for the learner to experience success.
- Self-determination: design a learning environment that supports learner autonomy, allow learners to define learning activities and outcomes, and practice empathy through positive, formative, and timely feedback.
- Self-directed learning: work with learners in identifying and formulating learning goals (e.g., through the use of learning contracts), engender problem- and project-based learning that draws from the learner's experience, and give the learner choice, autonomy, and flexibility in making decisions about his/her learning.
- Self-regulated learning: encourage learners to monitor their learning path, process, and achievements (e.g., by keeping a learning log) and incorporate the use of learning journals for reflection on the learning environment and learning process.
- Self-determined learning: in addition to applying the design approaches described above, allow learners to define learning goals and outcomes and to assess own learning (e.g., learning contracts), promote ongoing reflection on what is learned and how it is learned (e.g., learning journals), and include learning activities that support learner exploration, content creation, collaboration and networking with others, and sharing of results/findings (e.g., use of e-portfolios, social media, and personal learning environments).

ISBN 978-615-5511-25-7

Conclusion

As education shifts toward more learner-centeredness in the classroom, educators can draw from long established "self" pedagogies such as self-efficacy, self-determination, and self-directed (andragogy), self-regulated, and self-determined (heutagogy) learning in order to create a toolkit of teaching and learning approaches that support and promote learner agency. This paper has attempted to convey a basic understanding of the concepts of learner agency and the "self" pedagogies, while also identifying practical ways of applying the concepts.

References

1. Bandura, A. (1977). Self-efficacy: Toward a unifying theory of behavioral change. *Psychological Review, 84*(2), 191-215.
2. Bandura, A. (2001). Social cognitive theory: An agentic perspective. *Annual Review of Psychology, 52*, 1-26.
3. Blaschke, L. M. (2012). Heutagogy and lifelong learning: A review of heutagogical practice and self-determined learning. *The International Review of Research in Open and Distributed Learning, 13*(1), 56-71. Retrieved from http://www.irrodl.org/index.php/irrodl/article/view/1076/2087.
4. Blaschke, L. M. (2016a). Self-determined learning: Designing for heutagogic learning environments. In J. Elen, & G. Clarebout (Eds.), *Learning, design, and technology. An international compendium of theory, research, practice, and policy*. Heidelberg, Germany: Springer Verlag.
5. Blaschke, L. M. (2016b). *Strategies for implementing self-determined learning (heutagogy) within education: A comparison of three institutions (Australia, South Africa, and Israel).* (Unpublished master's thesis). Carl von Ossietzky Universität Oldenburg, Oldenburg, Germany.
6. Blaschke, L.M., & Hase, S. (2015). Heutagogy: A holistic framework for creating 21st century self-determined learners. In M.M. Kinshuk & B. Gros (Eds.), *The future of ubiquitous learning: Learning designs for emerging pedagogies* (pp. 25-40). Heidelberg, Germany: Springer Verlag.
7. Boud, D., & Higgs, J. (1993). Bringing self-directed learning into the mainstream of tertiary education. In N. Graves (Ed.), *Learner managed learning: Practice, theory and policy* (pp. 158-173). Great Britain, UK: Higher Education for Capability.
8. Deci, E. L., Eghrari, H., Patrick, B. C., & Leone, D. R. (1994). Facilitating internalization: The self-determination theory perspective. *Journal of Personality, 62*(1), 119-42. doi: https://doi.org/10.1111/j.1467-6494.1994.tb00797.x
9. Deci, E. L., & Ryan, R. M. (2002). *The handbook of self-determination research*. Rochester, NY: The University of Rochester Press.
10. Garnett, F. (2013, March 4). The PAH continuum: Pedagogy, andragogy, and heutagogy. Heutagogy Community of Practice [Blog post]. Retrieved from

ISBN 978-615-5511-25-7

https://heutagogycop.wordpress.com/2013/03/04/the-pah-continuum-pedagogy-andragogy-heutagogy/

11. Hase, S., & Kenyon, C. (2000). From andragogy to heutagogy. *UltiBase Articles*. Retrieved from https://epubs.scu.edu.au/gcm_pubs/99/
12. Kanwar, A. S., Balasubramanian, K., & Umar, A. (2013). Lifelong learning in South Africa. *International Journal of Continuing Education & Lifelong Learning, 5*(2), 17-39.
13. Knowles, M. (1975). *Self-directed learning: A guide for learners and teachers*. USA: Cambridge Adult Education.
14. Knowles, M. S., Swanson, M. A., & Holton, E. F. (2011). *The adult learner: The definitive classic in adult education and human resource development* (7th ed.). UK: Taylor & Francis.
15. Long, D. (1990). *Learner managed learning: The key to lifelong learning and development*. New York, NY: Kogan Page.
16. Luckin, R., Clark, W., Garnett, F., Whitworth, A., Akass, J., & Cook, J. (2010). Learner-generated contexts: A framework to support the effective use of technology for learning. In M. Lee & C. McLoughlin (Eds.), *Web 2.0-based e-learning: Applying social informatics for tertiary teaching* (pp. 70-84). Hershey, PA: IGI Global.
17. Maslow, A. H. (1943). A theory of human motivation. *Psychological Review, 50*, 370-396.
18. Olson, M. H., & Hergenhahn, B. R. (2009). *An introduction to theories of learning* (8th ed.). New Jersey: Pearson Prentice Hall.
19. Reeve, J. (2002). Self-determination theory applied to educational settings. In E.L. Deci & R.M. Ryan (Eds.), *Handbook of self-determination research* (pp. 183-203). United States: The University of Rochester Press.
20. Rogers, C. R. (1961). *On becoming a person: A therapist's view of psychotherapy*. Boston, MA, & New York, NY: Houghton Mifflin Company.
21. Wagner, B. D., & French, L. (2010). Motivation, work satisfaction, and teacher change among early childhood teachers. *Journal of Research in Childhood Education, 24*, 152-171. doi: 10.1080/02568541003635268.
22. Zimmerman, B. J., & Schunk, D. H. (2001). *Self-regulated learning and academic achievement: Theoretical perspectives* (2nd ed.). New York, NY, & London, UK: Routledge.

ISBN 978-615-5511-25-7

Towards Personalized Guidance and Support for Learning
Proceedings of the 10th European Distance and E-Learning Network Research Workshop, 2018
Barcelona, 24-26 October, 2018
ISBN 978-615-5511-25-7

VIDEOMINING FOR THE ASSESSMENT OF TEACHER SKILLS IN HIGHER EDUCATION

Mercè Gisbert, Mireia Usart, Universitat Rovira i Virgili, Spain

Summary

Recently, learning analytics and the use of big data to help teaching practices has increased. However, despite there is an easy access to teachers' big data regarding internet, MOOCs, VLEs and other logs; data from onsite teacher classroom activity is also needed, both to evaluate teacher skills both in face-to-face courses, and also in order to triangularize data to help having a complete view of the teacher competencies in blended learning contexts. With the implementation of videomining in onsite contexts, qualitative data from the teacher activity in class can turn into quantitative logs that are useful for real-time assessment and also as part of a bigger learning analytics processes. This study proposes a new methodology, based on the integration of video analysis data mining (videomining), for measuring teacher skills in the classroom. As a first step in the implementation of videomining for the assessment of teacher skills, we explain the process of a video analysis system, MED1A software, an evolution from the existing SME instrument named MED1C; observations conducted in classroom, and the later big data preparation description. This video analysis tool can manage big data from logs and catalogue teacher actions in real-time, multi-observer sources. In particular, we will show the example of teacher Digital Competence (DC) case. Conclusions show that videomining could help retrieving real-time, quantitative and qualitative data from teacher activity without having to spend hours of post-visioning and cataloguing data. This will help researchers, institutions and teachers to retrieve, analyse and later evaluate teacher's skills and guide them to a real reflection and better practice of their profession.

MED1C (Call: H2020-SMEINST-1-2014_24-09-2014 Funding scheme: SME instrument phase. Proposal number: 663957. Proposal acronym: MED1C. Duration (months): 4. Proposal title: Video Management in Medical Practice Activity: ICT-37-2014-1);

Introduction

In the last years, big data has landed in teaching and learning processes. In particular, the use of data in MOOCs and web videomining (Othman, Abdelali, & Jaber, 2016) have been studied in online learning contexts. However, a high percentage of Higher Education learning activities are still using blended or face to face methodologies. In Spain, in 2017, around 92% of highschool students are still enrolled in onsite education (Ministerio de Educación, Cultura y Deporte, 2017), an 82% of students are enrolled in onsite universities, and a 74% in Master degrees (GAD3, 2017). In these contexts, we believe that datamining in general, and the use of

big data from video analysis (videomining) in particular, could be useful for studying classroom activity of both teachers and learners.

Focusing on teacher activity, research on videomining is scarce; however, video analysis has been a key aspect for the reflection and assessment of teacher skills, as stated by Major and Watson (2018) in their systematic review of 23 video usage studies. These authors believe that video technology in general and video analysis in particular can be an opportunity to support in-service teacher training and development, as it can capture the complexity of teaching in classroom (Borko, Whitcomb, & Liston, 2009). Furthermore, and compared to classic observation, video analysis of teachers gives a greater access to classroom events (Ball & Cohen, 1999), without compromising authenticity (Sherin, 2004). Finally, the spread use of mobile devices can also be a help to the expert or researcher observation by real-time categorization of teacher activity, without the need of a big technological implementation that could hamper classroom normal activity (Aubusson, Schuck, & Burden, 2009).

This paper describes the implementation of a digital video analysis tool that records and categorizes teacher activity in educational face to face contexts. This tool allows the assessment of teacher skills and reflection of practitioners and researchers, based on existing skill evaluation rubrics; and could be a first step for designing future teacher's skills evaluation and training programs. In particular ,we have focused on a case of teachers Digital Competence (DC) in order to better show the results of the rubrics and taxonomy that can be implemented in the tool, and the videomining process outcomings. A complete detail of the process has been described and will be the theoretical base to implement this video analysis tool in further practical studies in different contexts in Higher Education.

The main aim is to set the basis for the implementation of a reliable and valid video analysis procedure to retrieve and evaluate teacher skills in the classroom. Based on the literature review, we ask the followings:

- How can we set up, measure and assess teacher skills with the use of a digital video analysis tool?
- Which are the principal phases and outcomes of the process (in particular, in the case of evaluating teacher DC)?

Teacher skills

Generic skills are defined as those competences that are common to the majority of professions. They are related to the integrated application of aptitudes, personality features, educational background and also other values (UNESCO, 2004; Wilson et al., 2011). These skills are usually learnt in work-related environments (both in real and simulated scenarios). With this assumption, training transversal competencies becomes of great complexity and demands the change of educational methodologies and the inclusion and support of new tools to facilitate these processes. In this direction, real-time video analysis techniques that help to reflect on particular situations could improve the teaching and learning process in general, and teaching skills in particular (Star, Lynch, & Perova, 2011).

ISBN 978-615-5511-25-7

Focusing on teacher activity in the classroom, it has been related to teaching, research and management skills. In particular, the two latter are specific for teachers in Higher Education. It must be taken into account that competences related to management are responsibilities that are subject to the personal commitment of the teacher. We must remember that these skills are not part of the essential teaching profession (Mas, 2012). The most important component in maximizing outcomes for learners leaving school is teachers and the quality of their teaching (Darling-Hammond & Youngs, 2002). Furthermore, one of the most important responsibilities that a teacher must assume in the design of a learning process is incorporating the Digital Competency (DC) training of his students in the activities that he must develop with them in the classroom (Gutiérrez, 2012; Tondeur, van Braak, & Valcke, 2007). This guides our first step for video analysis in the classroom: we focus on the analysis and evaluation of teaching skills, and in particular, on the teacher Digital Competence (DC). In particular, to be in line with the European Recommendation, we adopt the term proposed by Larraz (2013): Digital Competence requires the presence of four literacies: (a) information literacy, for managing digital information; (b) computer literacy, for treating data in different formats; (c) media literacy, for analysing and creating multimedia messages; and (d) communication literacy, for participating in a safe, ethical and civic manner from a digital identity.

Teacher DC proficiency implies naturally incorporating technologies to the teaching and learning activity, carrying out processes of innovation, transformation and change (Gisbert & Esteve, 2011, Lázaro, 2015, Schalk, 2010). Following Koehler and Mishra (2008) teachers should have technological, disciplinary and pedagogical knowledge (TPACK model). In summary, the competent teacher in a digital world is in constant development, he is able to strengthen his critical capacity to incorporate technology in classroom, "developing his technical skills guided by his own good judgment" (Castañeda, Esteve, & Adell, 2018; p.14). Regarding video analysis and teacher competences, there is a variety of teacher preparation programs that use video as an effective methodology for developing teachers' noticing skills (Roller, 2016). From Tripp and Rich (2012) study, it emerges that, in video analysis, teachers use codes or checklists to help facilitate their video reflections, usually tagging the number of times certain behaviours occur (e.g. the number of positive and negative feedback statements and questions that they used during their lesson). These authors state that the use of checklists help teachers to notice specific behaviours and to gain insights into their own teaching.

Assessment of teacher skills

Skill assessment is a complex process that should not be left to the subjective evaluator. It is therefore advisable to use some instruments that would not only discriminate competence indicators, but also provide a more objective and triangulated evaluation process. Cano (2008) explains that skill assessment requires using a variety of instruments and the involvement of different actors. The instruments must respond to a strategy of systematic information gathering. These tools can be closed (checklists, scales, rubrics, etc.) or open records, and can be used by one or several evaluators (360 model).

ISBN 978-615-5511-25-7

A difficulty is added when assessing in-service teacher skills. Most of the time, teacher competencies in classroom are not directly observable; these must be inferred by performance or specific behaviours. De Miguel (2007) notes that skills require new criteria and instruments to be used in the assessment procedures. Qualitative analysis has classically studied teachers while lecturing; both participant and non-participant observation are used in teacher skills evaluation. Regan-Smith, Hirschmann, and Lobst (2007) found that medicine teachers' skills improved over time after feedback was provided and repeat observations occurred. In particular, observed faculty receiving feedback improved their ranking, compared with non-observed teachers. Furthermore, we believe that with the implementation of cameras and mobile devices in the classroom there are new possibilities that bring researchers into the field of video analysis (Aubusson, Schuck, & Burden, 2009).

In the particular case of teacher DC (Gisbert, González, & Esteve, 2016), there are different tools to measure the skill level. As reviewed in Esteve (2015), it is necessary to define teacher DC together with the strategy to develop and evaluate it. We will therefore focus on the self-evaluation rubric consisting of 22 items (COMDID) designed and evaluated by Gisbert and colleagues (2018). COMDID groups teacher DC in four dimensions; each descriptor defined with four levels of development. (a) Didactic, curricular and methodological; (b) Planning, organization and management of digital technological spaces and resources; (c) Relational, ethical and security; (d) Personal and professional. Levels of development are based on Krumsvik (2009): Beginner, Medium, Expert and Transformative.

According to the cited studies, our aim is not to expand the range of skill measuring tools, but to accommodate each skill for assessment. Therefore, there is a need for a complete tool that allows researchers to implement theoretical categories of skills such as COMDID, and more important, a video analysis system that can transform this items into indicators observed and recorded during teacher activity. Video gives greater access to classroom events than classic observation (Ball & Cohen, 1999), without compromising authenticity (Sherin, 2004). It also has the capability to provoke cognitive, emotional and motivational processes (Seidel, Stürmer, Blomberg, Kobarg, & Schwindt, 2011). Video tools develop further as technology advances, and add both new and beneficial dimensions to teacher professional learning (Aubusson, Schuck, & Burden, 2009). Furthermore, as stated by Rich and Hannafin (2008), video annotation tools could help increasing teacher self-reflection, overcoming the limitations of video-captured episodes (or videoclips) that can only review teaching activity. Furthermore, tools such as MED1A implement a third dimension to video recording and video annotation: videomining.

Videomining to assess teacher skills: The case of MED1A

Othman, Abdelali, and Jaber (2016) studied web data mining in MOOCs, they stated that educational data mining is the emerging topic for research, and defined two approaches for web videomining: the use of traditional image processing and the metadata based approach. Their methodology has been used for mining MOOC videos using metadata. As mentioned in the introduction, the use of videomining in face to face teaching is scarce, however, a research

ISBN 978-615-5511-25-7

field in video analysis and video annotation tools has evolved the last decades. Institutions across the world are developing video analysis tools that make the process of viewing, analysing, and sharing videos easier. In a review of the use of video for teacher training worldwide, Brouwer (2011) identified three domains of application for video analysis: orientation, support, and assessment. Tochon (2008) explains that, this procedures are now practiced worldwide, using video as a valid method for teacher improvement. More, this practice is changing to a more global video-reflection, wherein teachers view videos of their own practice and think about the effects of particular actions within a situated environment (Tripp & Rich, 2012). Technological advances are pushing the use of video even further: it has enabled teacher administrators to recognize important patterns in teachers' practice (Rich & Hannafin, 2009).

Based on the existing research, we focused on the aspects that Tripp and Rich (2012) highlight in their complete review: teachers report that the use of a guiding framework (e.g., rubric, checklist, teaching principles) helps to focus their reflection. These authors show that some teachers prefer to choose their own focus. Thus, in our proposal, we looked for a balance between the use of a predetermined category framework (COMDID rubric) but also teacher choice of focus within that framework, that is also the reason why the phases proposed (Figure 2) have an iterative component.

Our approach focuses on the patterns mentioned by Rich and Hannafin, and introduces two different aspects of videomining in a single framework:

1. The use of categorized video episodes as big data (turning qualitative videos into time and category quantitative data logs that can be used for big data analysis).
2. The use of the categorized video episodes directly with the teachers in order to help in-time reflection of their teaching skills.

These two aspects are complementary and help building the whole picture of teacher skills in the classroom. In particular, we will explain the case of the implementation of teacher DC framework based on COMDID in the videomining tool chosen for our research: MED1A.

MED1C, a SME instrument founded by the European Commission Horizon 2020. MED1C software solution has a solid foundation, since it was launched 7 years ago by the SME 1d3a to cope with similar needs within the sector of Elite competition in sports. Some of their main customers are FC Barcelona, Aspire (QA), CSKA (RU) and FIBA. In particular, the evolution of MED1C into MED1A (Figure 1) is part of a research project involving different universities and companies around Europe. MED1A main features include a user friendly interface, fixing the complexity of having many video formats, allowing to tag and categorize actions during a classroom, reducing reports and video storage solely to relevant parts, allowing videomining across data bases, and offering a collaborative interface that can be used in mobile devices, helping observers and teachers in the process of skills evaluation. Following Suthers and Rosen (2011), an integrated analytics system would allow data and analytics layering: using

ISBN 978-615-5511-25-7

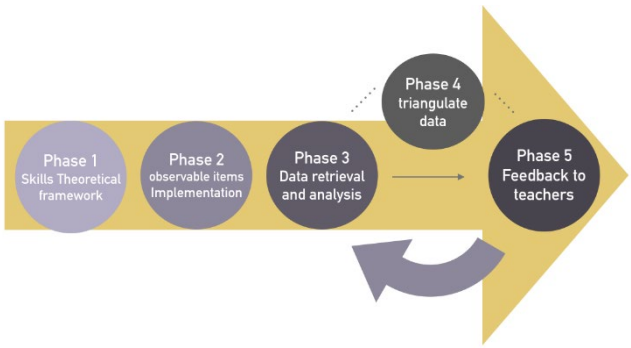
multiple data sets and analytics techniques in a single interface for visualizing and presenting data to practitioners. Thus, we believe that the choice of MED1A is appropriate for our aim.

Figure 1. Screenshots of MED1A, a video analysis and annotation tool for teaching and learning evaluation processes

Methodology

As a first step in the implementation of a video analysis tool in teacher skill evaluation in classroom, researchers worked together with the design team of MED1A and focused on the case of teacher DC and using the COMDID rubric, we define the following phases:

Phase 1 was devoted to choose the indicators for each of the 4 dimensions of the TDC. The research group worked as experts to implement at least 4 indicators for each dimension, according to the items in the questionnaire, and implement them in the buttons of the software tool (see Figure 3). In this phase it is very important to set the goal of the implementation: teacher skills evaluation, feedback to the teacher of one or more dimensions, data for triangularization of a blended learning environment, etc. Based on Esteve (2015) and Krumsvik (2009) we propose the following dimensions and levels of teacher DC: (a) Didactic, curricular and methodological. (b) Planning, organization and management of digital technological spaces and resources. (c) Relational, ethical and security. (d) Personal and professional. We propose the following levels for each skill, implemented as Likert scale variables with the following labels: Beginner, Medium, Expert and Transformative (see Evaluation Buttons in Figure 3). For each dimension, items were selected based on the 22 items of the rubric, and focusing on those items related to classroom actions (e.g. "use of ICT tool in the classroom").



10th EDEN Research Workshop Proceedings, 2018, Barcelona
ISBN 978-615-5511-25-7

Figure 2. Phases of the videomining process

Phase 2 consisted of the implementation of this items in the tool, the selection of the scales for each item, and also the implementation of other buttons useful for the observer and data retrieval, that would help teacher self-reflection when reviewing the videos. In this phase we believe that Likert scales can be useful for some indicators, also dichotomous variables such as "the teacher uses the digital board (Y/N)". Finally, a time-counter for each item was enabled, that can be very useful for retrieving actions such as "time spent answering student questions".

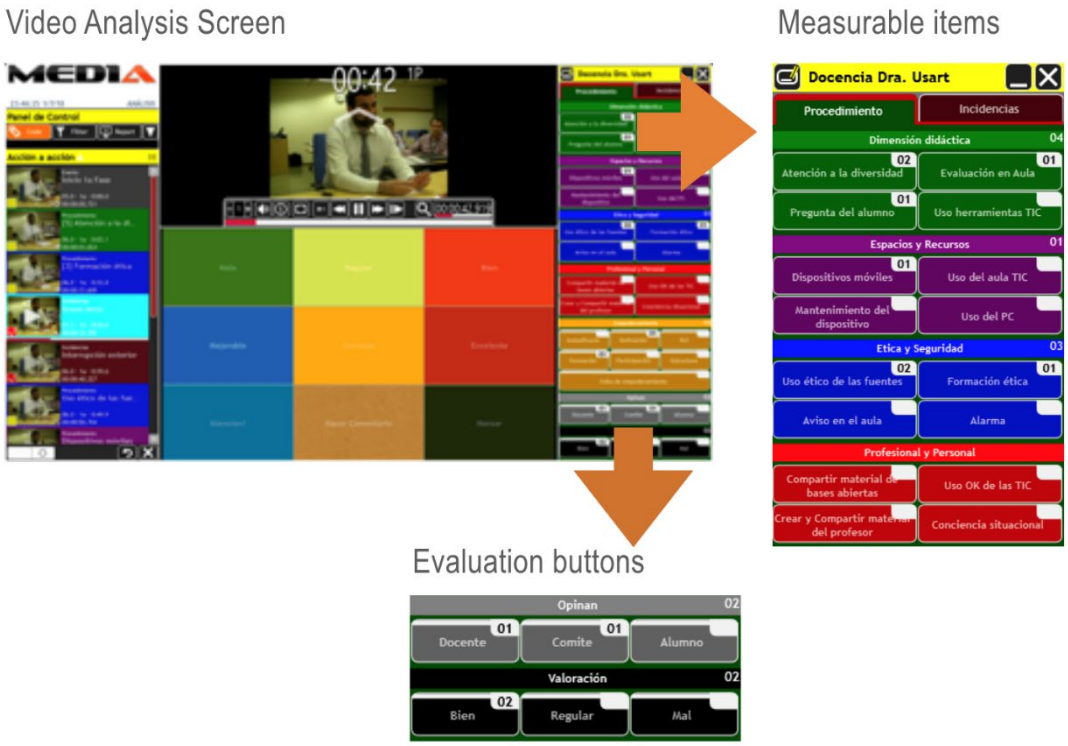


Figure 3. Screenshot of a teacher video analysis in MED1A

Phase 3 is focused on the observation process of the teacher in the classroom, MED1A has an app that helps non-intrusive observation and allows more than one observer to synchronous note each item during the lecture.

Furthermore, there is the possibility to implement more than one camera to the analysis, and also other data sources, such as a biodata measurements of the teacher. Video episodes are categorized and saved in the tool, and can be seen in the right side of the screen (Figure 3). Once again, setting the objective will help researchers and teachers design this phase.

Phase 4 is mostly for blended-learning and biodata evaluation processes, if we want to measure teacher DC not only in classroom but also in a Moodle context, we can to triangulate data with Moodle logs from teacher. All this data leads to a xml or csv file with all the logs from videos, both dichotomous, Likert, and time-logs, and helps the implementation of this big data source into a learning analytics software (see Figure 4).

ISBN 978-615-5511-25-7

Phase 5 implies teacher seeing the videos categorized and reflecting on the real action. It can be done just after the class has ended, as it does not need time to calculate or retrieve, it can also be accessed without internet, and from a mobile device, and as video categories are not really cut nor edited, teachers and researchers can contextualize each item observed in order to improve the reflection and evaluation of the whole process in context.

Figure 4. Screenshot of videomining screens in MED1A

Discussion, conclusions and further research

As mentioned in Siemens (2012), there is a gap between researchers and practitioners in education that ends up in a lack of communication between empirical research and educational practice. A methodology based on videomining could allow the measure of different competences in general, and teacher DC in particular. Furthermore, recent developments in video annotation tools make video reflection more viable and accessible: these tools make possible the process of teacher self-analysis using verifiable evidence (Bryan & Recesso, 2006). In particular, videomining offers the potential to support both reflection and analysis of one's own teaching and to link it to big data from different scenarios where teachers act. These tools, as Siemens states, should be intuitive and easy-to-use, in order to help more practitioners to use them and understand the results without the necessity of permanently working with a researcher.

Within this framework, the main aim of our study was to set the basis for the implementation of a reliable and valid measure and assessment for teacher skills in classroom activity. The two research questions have been answered with the particular case of teacher DC, as one of the key competences for practitioners in the ICT society. The first goal was to understand how to set up, measure and assess teacher skills with the use of a digital video analysis tool. According to Brouwer (2011), we design our methodology in the three domains of application for video-analysis: orientation, support, and assessment. We proposed and tested the implementation of the COMDID rubric in MED1A, a videomining tool with a solid background that allowed us to test the possibilities of the user-friendly interface and ease of use of the screens, buttons and scale types.

Following Krumsvik (2008) the basic use of ICT by a teacher does not warranty a skilled professional. We must link this use with the context and the pedagogical criteria of the practitioner. One of the goals of our implementation is to allow teachers reflect in a complete

ISBN 978-615-5511-25-7

and real scenario, making self-reflection more significant than only using a questionnaire or evaluation rubric. Using a tool such as MED1A helps saving time through real-time categorization from mobile devices, avoiding high review times. More, availability of the revised report and the need to provide immediate feedback so that processing changes is faster for teachers. The TPACK model (Koehler & Mishra, 2008) states that teachers will only be competent if they can activate disciplinar, pedagogy and technology skills. In this sense, we believe that future experiences of videomining in educational context must observe teachers in other contexts and focus on different skills. Another research topic is related to memory and MED1A immediate feedback for teachers.

Concerning the second goal: phases and outcomes of the process (in particular, in the case of teacher DC); we designed the main phases of the model. However, more research will be conducted in order to quantitatively test the phases proposed and analyse the data from videos, also triangulate it with data from online activity of teachers. The ease of use of MED1A when implementing and changing buttons and video sources can help teachers and non-technical profiles when implementing this video analysis tools. It also helps reflecting on the items and rubrics chosen for the observation, as seen in Figure 2, it can lead to DBR processes (Design-Based Research Collective, 2003) and help in the Iteration process of both the items and the observations in order to create a solid rubric. According to Tripp and Rich (2012), teachers report that the use of a guiding framework (e.g., rubric) helps to focus their reflection. However, some teachers prefer to choose their own focus. According to this real needs, we looked for a balance between the use of a predetermined category framework (COMDID rubric) but also teacher choice of focus within that framework, that is why the phases proposed have an iterative component.

In summary, we believe that the use of videomining tools such as MED1A can help in the measure and evaluation of teacher skills. The methodology presented is a first step that aims to show how to implement a taxonomy for video analysis, as in teacher DC, focus on the fact that usually video analysis was used for teachers and researchers to reflect on the activity. Existing linear video practices provide holistic snapshots but are difficult to systematically observe, analyse, or reflect on individual teaching practices (Hewitt, Pendretti, Bencze, Vaillancourt, & Yoon, 2003). We give a step forward with the implementation of an evaluation rubric such as COMDID, that will give a solid based on theory guide to evaluate and further reflection and design, together with institutions and other researchers, more significant evaluation and training programs for teachers. This programs could use videos and real-time analysis, immediate post-classroom reflection with other teachers and researchers. A second phase of triangularization of data to help deeper reflection and improving the rubrics that measure the different competences in all the contexts where teaching takes part.

References

1. Aubusson, P., Schuck, S., & Burden, K. (2009). Mobile learning for teacher professional learning: Benefits, obstacles and issues. *Research in Learning Technology, 17*, 233–249. doi: 10.1080/09687760903247641

ISBN 978-615-5511-25-7

2. Ball, D., & Cohen, D. (1999). Developing practice, developing practitioners: Towards a practice-based theory of professional education. In G. Sykes & L. Darling-Hammond (Eds.), *Teaching as the learning profession: Handbook of policy and practice* (pp. 3–32). San Francisco, CA: Jossey Bass.
3. Beal, C. R., Qu, L., & Lee, H. (2006). *Classifying learner engagement through integration of multiple data sources.* Paper presented at the 21st National Conference on Artificial Intelligence (AAAI-2006), Boston, MA.
4. Borko, H., Whitcomb, J., & Liston, D. (2009). Wicked problems and other thoughts on issues of technology and teacher learning. *Journal of Teacher Education, 60*, 3–7. doi: 10.1177/0022487108328488
5. Brouwer, N. (2011). *Imaging teacher learning: a literature review on the use of digital video for preservice teacher education and professional development.* Paper presented at the annual meeting of the American educational research association, New Orleans, LA.
6. Bryan, L. A., & Recesso, A. (2006). Promoting reflection with a Web-based video analysis tool. *Journal of Computing in Teacher Education, 23*(1), 31-39. doi: 10.1080/10402454.2006.10784557
7. Cano González, R. (2008). La formación de maestros en España (1838-2008): Necesidades sociales, competencias y planes de estudio. *Educación XXI, 11*, 73-101. doi: 10.5944/educxx1.11.0.310
8. Castañeda, L., Esteve, F., & Adell, J. (2018). Un Modelo Holístico de Competencia Docente para el Mundo Digital. *Revista Interuniversitaria de Formación del Profesorado, 32*(1). Retrieved from http://repositori.uji.es/xmlui/bitstream/handle/10234/174771/58806.pdf?sequence=1&isAllowed=y
9. Chao-Hsiu Chen (2008). Why Do Teachers Not Practice What They Believe Regarding Technology Integration? *The Journal of Educational Research, 102*(1), 65-75. doi: 10.3200/JOER.102.1.65-75
10. Darling-Hammond, L., & Youngs, P. (2002). Defining "Highly Qualified Teachers": What Does "Scientifically-Based Research" Actually Tell Us? *Educational Researcher, 31*(9), 13-25. doi: 10.3102/0013189X031009013
11. Design-Based Research Collective (2003). Design-based research: An emerging paradigm for educational inquiry. *Educational Researcher, 32*(1), 5-8. doi: 10.3102/0013189X032001005
12. Esteve, F., Duch, J., & Gisbert, M. (2014). Los aprendices digitales en la literature científica: diseño y aplicación de una revisión sistemática entre 2001 y 2010. Pixel-bit. *Revista de Medios y Educación, 45*, 9-21. Retrieved from http://acdc.sav.us.es/pixelbit/images/stories/p45/01.pdf

ISBN 978-615-5511-25-7

13. GAD3 (2017). *GAD3 elabora un estudio de salidas profesionales para el MBA de UNIR.* Retrieved from https://www.gad3.com/single-post/GAD3-elabora-un-estudio-para-UNIR-sobre-los-estudiantes-de-MBA

14. Gisbert, M., Espuny Vidal C., & González, J. (2011). INCOTIC. Una herramienta para la @utoevaluación diagnóstica de la competencia digital en la universidad. *Profesorado: revista de currículum y formación de profesorado, 15*(1), 76-89. Retrieved from http://hdl.handle.net/10481/15327

15. Gisbert, M., González, J., & Esteve, F. M. (2016). Competencia digital y competencia digital docente: una panorámica sobre el estado de la cuestión. *Revista Interuniversitaria de Investigación En Tecnología Educativa, (Junio)*, 74–83. doi: 10.6018/RIITE2016/257631

16. Gisbert, M., Lázaro, J. L., Usart, M., & Molero-Aranda (2018, July). *Development and evaluation of the digital teaching competence from a transformative perspective.* Paper presented at the World Federation of Associations for Teacher Education, Fifth Biennial Conference, Melbourne.

17. Gutiérrez, A. (2002). *Las prácticas sociales: una introducción a Pierre Bourdieu.* Madrid: Tierradenadie ediciones.

18. Hewitt, J., Pedretti, E., Bencze, L., Vaillancourt, B. D., & Yoon, S. (2003). New applications for multimedia cases: Promoting reflective practice in preservice teacher education. *Journal of Technology and Teacher Education, 11*(4), 483-500. Retrieved from https://www.learntechlib.org/p/14616/

19. Koehler, M. J., & Mishra, P. (2008). Introducing technological pedagogical content knowledge. In A. E. R. Association (Ed.), *Annual meeting of the American Educational Research Association.*

20. Krumsvik, R. (2009). Situated learning in the network society and the digitised school. *European Journal of Teacher Education, 32*(2), 167-185. doi: 10.1080/02619760802457224

21. Larraz Rada, V. (2013). *La competència digital a la Universitat.* Universitat d'Andorra.

22. Lázaro Cantabrana, J. L. (2015). *La competència digital docent com a eina per garantir la qualitat en l'ús de les tic en un centre escolar.* Universitat Rovira i Virgili. Retrieved from http://www.tdx.cat/handle/10803/312831

23. Major, L., & Watson, S. (2018) Using video to support in-service teacher professional development: the state of the field, limitations and possibilities. *Technology, Pedagogy and Education, 27*(1), 49-68, doi: 10.1080/1475939X.2017.1361469

24. Mas, Ó. (2012). Las competencias del docente universitario: la percepción del alumno, de los expertos y del propio protagonista. REDU. *Revista de Docencia Universitaria, 10*(2), 299-318. Retrieved from https://dialnet.unirioja.es/servlet/articulo?codigo=4021101

25. de Miguel, M. (Ed.) (2007). *Metodologías de enseñanza y aprendizaje para el desarrollo de competencias. Orientaciones para el profesorado universitario ante el Espacio Europeo de Educación Superior.* Madrid: Alianza Editorial.

ISBN 978-615-5511-25-7

26. Ministerio de Educación, Cultura y Deporte (2017). *Datos y cifras. Curso Escolar 2016/1017.* Madrid: Ministerio de Educación, Cultura y Deporte

27. Othman, E. H., Abdelali, S., & Jaber, E. B. (2016). Education data mining: Mining MOOCs videos using metadata based approach. *Proceedings of the 4th IEEE International Colloquium on Information Science and Technology (CiSt), Tangier, 2016*, 531-534. doi: 10.1109/CIST.2016.7805106

28. Regan-Smith, M., Hirschmann K., & Lobst, W. (2007). Direct Observation of Faculty with Feedback: An Effective Means of Improving Patient-Centered and Learner-Centered Teaching Skills. *Teaching and Learning in Medicine, 19*(3), 278-286. doi: 10.1080/10401330701366739

29. Rich, P. J. & Hannafin, M. (2008). Video Annotation Tools: Technologies to Scaffold, Structure, and Transform Teacher Reflection. *Journal of Teacher Education, 60*(1), 52-67. doi: 10.1177/0022487108328486

30. Roller, S. A. (2016). What they notice in video: a study of prospective secondary mathematics teachers learning to teach. *Journal of Mathematics Teacher Education, 19*, 477-498. doi: 10.1007/s10857-015-9307-x

31. Seidel, T., Stürmer, K., Blomberg, G., Kobarg, M., & Schwindt, K. (2011). Teacher learning from analysis of videotaped classroom situations: Does it make a difference whether teachers observe their own teaching or that of others? *Teaching and Teacher Education, 27*(2), 259-267. doi: 10.1016/j.tate.2010.08.009

32. Sherin, M. G. (2004). New perspectives on the role of video in teacher education. In J. Brophy (Ed.), *Using video in teacher education: Advances in research on teaching* (Vol. 10, pp. 1–27). Oxford: Elsevier Press.

33. Siemens, G. (2012) Learning Analytics: Envisioning a Research Discipline and a Domain of Practice. *Proceedings of the Second International Conference on Learning Analytics and Knowledge, LAK 2012*, 4-8. Retrieved from https://dl.acm.org/citation.cfm?id=2330605

34. Star, J. R., Lynch, K. H., & Perova, N. (2011). Using video to improve mathematics' teachers' abilities to attend to classroom features: A replication study. In M. G. Sherin, V. R. Jacobs, & R. A. Phillipp (Eds.), *Mathematics teacher noticing: Seeing through teachers' eyes* (pp. 117–133). New York: Routledge.

35. Suthers, D., & Rosen. A (2011). Unified framework for multi- level analysis of distributed learning. *Proceedings of the 1st International Conference on Learning Analytics and Knowledge*, 64-74. doi:10.1145/2090116.2090124

36. Tochon, F. (2008). A brief history of video feedback and its role in foreign language education. *CALICO Journal, 25*(3), 420-435. Retrieved from http://www.jstor.org/stable/calicojournal.25.3.420

ISBN 978-615-5511-25-7

37. Tondeur, J., van Braak, J., & Valcke, M. (2007). Curricula and the use of ICT in education: Two worlds apart? *British Journal of Educational Technology, 38*(6), 962-976. doi:10.1111/j.1467-8535.2006.00680.x

38. Tripp, T., & Rich, P. (2012). Using video to analyze one's own teaching. *British Journal of Educational Technology, 43*, 678-704. doi: 10.1111/j.1467-8535.2011.01234.x

39. UNESCO (2004). *Las tecnologías de la información y la comunicación en la formación docente.* Uruguay: Editorial TRILCE.

40. Wilson, C., Grizzle, A., Tuazon, R., Akyempong, K., & Cheung, C. K. (2011). *Alfabetización Mediática e informacional: Curriculum para profesores.* UNESCO.

Acknowledgements

We thank COMDID: ESTRATÈGIA FORMATIVA PER AL DESENVOLUPAMENT DE LA COMPETÈNCIA DIGITAL DOCENT (Ref. 2014 ARMIF 00039). Disseny i validació d'una estratègia per a l'avaluació i certificació de la competència digital docent (ref. 2015 ARMIF 00035) and also Jesus de Pablos and all the MED1A team for performing the technical implementation of the rubric, and for allowing all the tests with the COMDID, helping during all the process and sharing the screenshots.

ISBN 978-615-5511-25-7

Towards Personalized Guidance and Support for Learning
Proceedings of the 10th European Distance and E-Learning Network Research Workshop, 2018
Barcelona, 24-26 October, 2018
ISBN 978-615-5511-25-7

TEACHERS' PERCEPTIONS ON DIGITAL TECHNOLOGIES: IDENTIFICATION OF PATTERNS AND PROFILES IN THE CATALAN CONTEXT

Montse Guitert, Teresa Romeu, Marc Romero, Pedro Jacobetty, UOC, Spain

The purpose of this article is to understand the perspectives of Catalan teachers regarding the role of digital technologies in Education. The analysis relied on questionnaire survey data, using multivariate statistical analysis (principal component analysis or PCA) in order to understand patterns in teacher perspectives about digital technologies. This was followed by employing a clustering technique to identify teacher profiles of perspectives on the relation between digital technologies, teaching and learning based on those patterns (using principal component scores). During a later stage, those profiles were characterized by relating them with teacher characteristics, digital competence levels, and usage of digital technologies in teaching practices. Our findings suggest that there are 5 main patterns that structure teachers' perspectives on this relation: usefulness for networked learning, usefulness for effective learning, usefulness in the learning process, threats for learning and importance of combining new technologies with traditional methods. In addition, six teacher profiles were identified based on the teachers' positioning regarding those five perspective patterns.

Introduction

The recent developments in Information and Communication Technologies (ITCs) are transforming how we live, work, produce knowledge and learn. This transformation is visible in the educational field as well, since there has been a profound process of implementation of ICTs in educational institutions as reported by some authors such as Area et al. (2014) or Paredes et al. (2015). In the case of Catalonia, the education department of the government has supported the integration of ICT in education, considering it in the in the Education Law of Catalonia (LEC), in which ICTs are addressed explicitly and, according to the Article 52, "to train students for the critical analysis of the media and the use of new technologies" is a main objective. In addition, it states that curricula "should be oriented towards the acquisition of basic skills, which should contribute to the personal development of students and to the practice of active citizenship, and must incorporate information and communication technologies in the learning processes". Thus, a critical perspective on ICTs usage and its connection to citizenship is already included in the LEC of 2009.

The education department defined the students' digital competence back in 2013 and how it should be integrated in the educational curricula. Considering the previously cited law, this emphasis on student digital competence must not be isolated from a change in the role of

teachers, which the law also mentions. In the article 104 on teaching function it is indicated that "the teachers and professors have, among others, the functions of … using information and communication technologies, which they must know and master as a methodological tool". Also, with respect to teacher training in the text, it is specified that "initial teacher training should include … mastery of information and communication technologies". In the legal text's framing of ICTs in teaching, technologies themselves are not considered the primary vector of intervention but become subordinated to the roles of the teacher and pedagogical methodology.

It is known that teachers' perceptions greatly impact their teaching practices (Domingo & Garganté, 2016). There have been qualitative studies on teacher views of ICTs (Alonso, Guitert, & Romeu, 2014; Area et al., 2014). This paper deals with the same phenomena in a quantitative approach, while trying to be faithful to the original complexity and heterogeneity of teacher perspectives on the relation between digital technologies, teaching and learning. The method employed was an international online questionnaire survey, undertaken in the frame of the DECODE, (DEvelop COmpetences in Digital Era – co-funded by the Erasmus+ Programme of the European Union; reference 2016-1-IT02-KA201-024234) research project. This article focuses on the questionnaire and the data from Catalonia.

Method

The survey was sent to the directorate of non-higher education Catalan schools (kindergarten, primary, secondary and vocational training), who were asked to share it among each schools' teaching staff (total sample size of 425 after filtering out incomplete cases). Two questions containing sets of Likert-scaled items were used to measure teachers' perceptions about technology. The first set of items is related to the usefulness of technologies in learning and teaching. Respondents were asked to rate them according to a 5-point scale ranging from *Not at all* to *Very useful*. The second set of items consisted on phrases related to the impact of technology in learning and teaching. Those items were rated according to a 4-point scale ranging from *Totally disagree* to *Totally agree*. The Likert-scaled items were then treated as quantitative (interval) variables. In order to make sense of the variables related to the personal views of teachers regarding educational technologies, we performed a dimension reduction technique called principal component analysis (PCA). It allows the identification principal components, which are linear combination of variables that reduce complexity and help the analytical process. The PCA statistical technique (Jolliffe, 2011) uses an orthogonal transformation to convert observations of possibly correlated variables into values of linearly uncorrelated (not directly observed) variables called principal components. This transformation is defined such that the first principal component has the largest possible variance (i.e., accounts for as much of the variability in the data as possible), and each succeeding component has the highest variance possible – under the constraint that it is orthogonal to the preceding components. The result is a new orthogonal coordinate system that optimally describes variance in a dataset: reducing a large set of variables to a smaller set while containing most of the original information.

ISBN 978-615-5511-25-7

The resulting components were then used for creating teacher profiles, using a clustering (segmentation) technique, on the basis of their perspectives on the relation between technology teaching and learning. The cluster analysis was carried out using the standardized principal component scores resulting from the abovementioned PCA and the k-means partition method (Aldenderfer & Blashfield, 1984; Hartigan, 1975). The *optimal* number of clusters was identified using the traditional approach of calculating the cluster solution for the various numbers of clusters and plotting the within-cluster error for each. The resulting *scree plot* should show an *elbow* – point in which the relative change in error stops diminishing substantially as the number of clusters in the solution increases – at the correct number of clusters s (Gierl & Schwanenberg, 1998; Gower, 1975). Finally, those profiles were characterized in relation to professional and socio-demographic variables, digital competence, internet usage patterns, and the adoption of digital tools in their teaching practices. The questionnaire contained the digital competence Likert-scaled indicators from the European Framework for the Digital Competence of Educators: DigCompEdu (Redecker, 2017), which were treated quantitatively and averaged to create a single digital competence index.

Results

Principal Component Analysis (PCA)

The PCA used 21 items (the previously mentioned employability skills) and was performed in R (version 3.4.0) using the Principal components analysis (*principal*) function of the Procedures for Psychological, Psychometric, and Personality Research (*psych*) package (version 1.8.4). The overall Kaiser-Meyer-Olkin (KMO) measure of sample adequacy (MSA) is 0.91 and the same measure for each variable has a minimum value of 0.73 which means the sample is adequate for performing a PCA (minimum acceptability threshold is 0.6). The PCA resulted in 4 principal components with an Eigenvalue bigger than one, the rule of thumb for identifying number of components, but we decided to retain a fourth (its Eigenvalue was 0.88, thus close to one). Finally, the PCA used the varimax orthogonal rotation method. The high values of variables loadings (variable loadings in each principal component translate the covariance/correlation between the original variables and the components) allow the characterization of the different components. The naming of each component resulted from the interpretation of the associated variables (presented in the order of the highest loadings):

The first component was mainly associated with the following variables:

- improve communication, collaboration and coordination between colleagues, students and institutions;
- strengthen continued professional development (CPD) as a teacher;
- involve other actors in the learning process;
- link school activities with work experience practices;
- integrate formal, non-formal and informal learning.

ISBN 978-615-5511-25-7

Since it seemed to point to the usefulness of ICTs for making connections in the pedagogic process, both within the classroom and with the exterior environment, we named it "Useful for networked learning".

The second component was mainly associated with the following variables:

- to make students more autonomous;
- to make students more active in their own education;
- to make the learning process more meaningful for students;
- to make the learning process more effective (students who have achieved superior results than expected);
- to make the learning process more efficient (success with less effort and / or lower costs).

This component also seems related to the pedagogic process, but mostly refers to the effects of technology in terms of autonomy and content knowledge meaningfulness and acquisition. Thus, we named it "Useful for effective learning".

The third component was mainly associated with the following variables:

- the use of digital technologies promotes the development of responsible digital and media skills;
- the use of digital technology promotes positive learning outcomes by influencing how students behave;
- the use of digital technology promotes the development of basic skills (reading, writing, understanding);
- the use of digital technologies helps when designing and organizing educational materials;
- the use of digital technologies encourages student self-evaluation.

The third component, like those before, is also associated with the pedagogical possibilities of technology: the acquisition of basic digital, media, reading and writing skills, positive impact in student behaviour, in addition to material design and organization as well as student self-evaluation. Therefore, we chose the name "Useful in the learning process" in order to denote the more operational aspects of these items.

The fourth component was mainly associated with the following variables:

- the use of digital technologies is a distraction for students;
- the use of digital technologies increases the level of cyberbullying;
- digital technologies do not improve the processes of teaching and learning.

This component is clearly related to a negative view of technology, so we termed it "Threats for learning".

The fifth and last component was mainly associated with the following variables:

ISBN 978-615-5511-25-7

- it is necessary to integrate e-learning into teaching activities, along with traditional classroom-based teaching methods;
- the use of digital technologies does not have to replace traditional methods of teaching;
- the daily use of technology in the classroom is not enough, students need to learn how to use books.

The component is most associated with variables that relate to the irreplaceability of traditional teaching methods by technology, which led us to name it "Useful only when combined with traditional methods".

Cluster analysis

The following section refers to the comparative characterization of teacher profiles found through cluster analysis (see Table 1):

Table 1: Teacher profiles and averages of the principal component scores used as inputs in the cluster analysis

Cluster	N	%	Usefulness for networked learning	Usefulness for effective learning	Usefulness in the learning process	Threats for learning	Useful only when combined with traditional methods
1	120	28	0.20	0.58	-0.65	0.15	-0.57
2	96	23	0.19	0.09	0.06	-0.80	1.07
3	81	19	0.63	-0.41	0.80	-0.34	-0.70
4	55	13	-1.83	-0.03	0.20	0.16	-0.11
5	40	9	-0.06	-1.67	-1.02	0.61	0.15
6	33	8	0.30	0.71	1.12	1.61	0.65
Total	425	100	0	0	0	0	0

Profile 1

Teachers in the most common profile, containing 28% of the total sample, consider technology useful for effective learning but not useful in the teaching-learning process and tend to neglect the importance of combining it with traditional teaching methods. The digital competence of these teachers does not differ from the overall sample. This seems to suggest an idealized but not applicable perspective on the relationship between technology, teaching and learning. In terms of socio-demographic and professional characterization, teachers in this profile seem to follow the overall sample distribution except for gender, containing a higher percentage of women. Personal digital technologies usage also tends to follow the overall sample distribution except that these teachers tend not to use said technologies for leisure. Finally, their usage of digital tools for teaching practices is also typical, except for a higher usage of tools for audio/video/graphic edition.

Profile 2

The second most common profile contains 23% of the sample and is the profile that mostly considers the importance of combining digital technologies with traditional methods while, at

ISBN 978-615-5511-25-7

the same time, the one which least associates it with learning barriers. This profile's perspectives on digital technologies' usefulness for learning (networked learning, effective learning and learning process) are close to the overall sample mean and it shows higher values of digital competence. Thus, it denotes a balanced position that stresses the importance of traditional methods. It does not differ greatly in terms of professional and socio-demographic characteristics from the whole sample, except that it tends to contain more school digital coordinators. Personal digital technologies usage is similar to the first profile except that these teachers tend to use them for leisure. Comparatively, a greater diversity of tools is also more frequently used in their teaching practices: tools for audio/video/graphic edition, office and similar programs, learning/communication/collaboration environments, and relevant multimedia programs.

Profile 3

In third place, containing 19% of the sample, comes the profile that most neglects the importance of combining digital technologies with traditional methods. It tends emphasise formal usefulness (aiding in networking and in the learning process) of digital technology for learning but not its pedagogical effectiveness. The digital competence level of this profile tends to be close to that of the overall sample. These teachers tend to be older and teach in lower level schools. Personal digital technology usage is associated with professional networks and personal/professional development. Digital tools usage in teaching follows the overall sample distribution but the profile shows a greater tendency for using digital forms of self- and co-assessment, and also using digital rubrics for assessment.

Profile 4

The fourth profile contains 13% of the sample and is characterized by average values (close to 0) in all component scores except for usefulness in networked learning. This profile is thus characterized by a sceptical view about technology's ability to connect learning to other spheres of activity. The digital competence level of this profile is comparatively lower. The profile contains less women and less school digital coordinators. These teachers tend to be younger and teach in higher level schools (secondary overrepresented). In terms of digital technology usage in learning, they tend (somewhat expectedly) not to create blogs and websites nor to use learning/communication/collaboration environments. They are also characterized for not using coding/computational thinking in teaching nor digital portfolios for assessment.

Profile 5

The fifth profile, containing 9% of the sample, is characterized by the lowest scores in the usefulness for effective learning and in the teaching-learning process, accompanied by a significantly higher identification of technology with threats to learning. Its level of digital competence is lower than the overall sample. These teachers tend to be older, contain less women, teach in higher level schools (VET highly overrepresented), and contain less school

ISBN 978-615-5511-25-7

digital coordinators. They exhibit the tendency not to use digital technologies: neither for personal usage nor as tools for teaching or assessment.

Profile 6

Finally, the sixth profile, which contains 8% of the sample, shows both the highest values in terms of considering digital technologies useful for effective learning and the learning process, as well as the highest values concern with threats they may pose to learning. In addition, it also tends to highlight the importance of combining those technologies with traditional methods. These teachers tend to be older, contain more women, teach in higher level schools (secondary schools are overrepresented), and contain less school digital coordinators. It exhibits the highest level of digital competence of all the identified profiles and a higher tendency to engage in all personal uses of digital technologies (social networks, professional networks, personal/professional development, and leisure). Finally, these teachers tend to use all sorts of more frequently than their counterparts except for resources for creating blogs and websites, and a high proportion of them uses all the asked digital assessment tools.

Conclusions

The performed PCA suggests that there are five main big patterns that organize Catalan teachers' perceptions on the relationship between digital technologies and education. The first three are related to the pedagogic usefulness of technologies: one related to the possibilities of a more open and socially inclusive education model (networked learning), another to the successful acquisition of knowledge and skills (effective learning), and the last is associated with improvements in the pedagogical situations (learning process). There are, however, other patterns in teacher perspectives that do not associate digital technology with usefulness but with dangers (threats for learning) and with the older, traditional teaching and learning methods (importance of combining digital technologies with traditional methods).

In order to better understand the heterogeneous reality of this perspectives, it is not enough to identify agglomerating patterns in terms of perspectives on technology and education. It is important to describe how the teachers position themselves in relation to these axes. This is the rationale behind the creation of teacher profiles. The recent development of computing and other digital technologies has been rapidly changing the daily lives of an increasing amount of the world's population. In the field of educational technology, like in many other fields of scholarship that deal with the impact of emerging technologies, there is a *default logic* which associates computing with a general tendency towards improvement (Bigum, Bulfin, & Johnson, 2015). This *default logic* is not limited to research about education and technology but also to the perception of most Catalan teachers: the most common profile (profile 1) seems to have a positive view on technology but not on the possibility of articulating it in their teaching practices (learning process).

The second most common profile, however, is related to the importance of integrating and combining new technologies with traditional methods, referring to a more balanced and

ISBN 978-615-5511-25-7

nuanced perspective on this relation. The third profile sees the formal benefits of technology but not it's pedagogical effectiveness. The fourth tends to be sceptical of the networking and connecting possibilities of digital technologies in education. The fifth profile comprises those who tend to be critical of digital technology's usefulness for teaching and learning. Finally, the sixth and smallest profile comprises the teachers who are advanced users of digital technologies. The identification of those teachers is useful in the sense that they can be ascribed an orienting role in training programmes to foster their colleagues' methodological digital competence and critical awareness of both the possibilities and the dangers those technologies pose to learning.

The profiles identified can be useful in the detection of teachers' training needs for the design of training proposals in digital competences. Further research can be focused on the relationship between the identified profiles with teachers' level of digital competence in order to design training proposals adapted to each of these profiles.

References

1. Aldenderfer, M. S., & Blashfield, R. K. (1984). Cluster analysis. *Sage University Paper series on Quantitative Applications in the Social Sciences, No. 07-044.* Newbury Park, NJ: Sage.
2. Area, M., Alonso, C., Correa, J. M., Moral, M. E. D., Pablos, J. D., Paredes, J., ... & Valverde, J. (2014). Las políticas educativas TIC en España después del Programa Escuela 2.0: las tendencias que emergen. *RELATEC: Revista Latinoamericana de Tecnología Educativa, 13*(2), 11-34.
3. Alonso, C., Guitert, M., & Romeu, T. (2014). Los entornos 1x1 en Cataluña: entre las expectativas de las políticas educativas y las voces del profesorado. *Educar, 50*(1), 41-64.
4. Bigum, C., Bulfin, S., & Johnson, N. F. (2015). Critical Is Something Others (Don't) Do: Mapping the Imaginative of Educational Technology. In S. Bulfin, N. F. Johnson, & C. Bigum (Eds.), *Critical perspectives on technology and education.* NY: Palgrave.
5. Departament d'Ensenyament de la Generalitat de Catalunya (2013). Competencies bàsiques en l'àmbit digital Barcelona: Generalitat de Catalunya.
6. Domingo, M. G., & Garganté, A. B. (2016). Exploring the use of educational technology in primary education: Teachers' perception of mobile technology learning impacts and applications' use in the classroom. *Computers in Human Behavior, 56*, 21-28.
7. García-Valcárcel, A., & Tejedor, F. J. (2017). Percepción de los estudiantes sobre el valor de las TIC en sus estrategias de aprendizaje y su relación con el rendimiento. *Educación XX1, 20*(2), 137-159. doi: 10.5944/educxx1.19035
8. Gierl, H., & Schwanenberg, S. (1998). A comparison of traditional segmentation methods with segmentation based upon artificial neural networks by means of conjoint data from a Monte Carlo simulation. In I. Balderjahn, R. Mathar, & M. Schader (Eds.), *Classification, data analysis, and data highways* (pp. 386–392). Berlin: Springer.

ISBN 978-615-5511-25-7

9. Gower, J. C. (1975). Generalized Procrustes analysis. *Psychometrika, 40*, 33–51.
10. Hartigan, J. (1975). *Clustering algorithms.* New York: John Wiley.
11. Jolliffe, I. (2011). Principal component analysis. In M. Lovric (Ed.), *International encyclopedia of statistical science* (pp. 1094-1096). Berlin, Heidelberg: Springer.
12. Paredes, J., Guitert M., & Rubia B. (2015). La innovación y la tecnología educativa como base de la formación inicial del profesorado para la renovación de la enseñanza. *Revista Latinoamericana de Tecnología Educativa, 14*(1), 101-114.
13. Redecker, C. (2017). *European Framework for the Digital Competence of Educators: DigCompEdu.* EUR 28775 EN. Publications Office of the European Union, Luxembourg. http://dx.doi.org/10.2760/159770.

ISBN 978-615-5511-25-7

Towards Personalized Guidance and Support for Learning
Proceedings of the 10th European Distance and E-Learning Network Research Workshop, 2018
Barcelona, 24-26 October, 2018
ISBN 978-615-5511-25-7

TEACHERS' DIGITAL COMPETENCIES FOR E-LEARNING APPLICATION IN HIGHER EDUCATION

Sandra Kučina Softić, University of Zagreb University Computing Centre, Croatia

Summary

New technologies bring new opportunities for teaching and learning, asking the teacher to keep up with time and technology and to try out new methods and apply them in a proper and high-quality way in the educational process. But with a growing number of tools and technologies, teachers often lose the battle because they cannot keep track with all the news, inform themselves about them and figure out how to integrate them into the educational process. Johannesen and Eide (2000) point out that the application of information and communication technologies in the education process needs to be carefully planned and devised to be set in the pedagogical context. Teachers are expected to have good pedagogical knowledge and to know how to integrate new technology into teaching. But technology brings new levels of complexity and demands new knowledge and skills. It is primarily upon teachers to realize what kind of digital competencies they have and how much training do they need in order to be efficient in e-learning implementation into educational process. In this research it was investigated what is the attitude of the teachers at the University of Zagreb toward e-learning and what digital competencies they need to be able to apply e-learning into their teaching. Results showed that teachers have a positive attitude towards ICT and e-learning application in educational process, yet they need support and training to use new technologies in a more innovative and efficient way.

Background

Johannesen and Eide (2000) state that the improvement in ICT should be incorporated into the pedagogical training of teachers. It is very difficult for teachers to expect to be innovative or teach differently from the *historical model* (the teacher is at the centre of the education process and conveys knowledge to students) unless he/she understands other possible ways of teaching based on theory and research. Besides being well acquainted with technology, teachers have to be as well competent to find a way how to integrate it into teaching, what can be additional burden to them. The teacher can also become tired by constantly looking for and introducing new teaching methods. It should not be forgotten that they are expected to keep track of their expertise in the field, to acquire new knowledge through practice, research and training, but also to be a good scientist and researcher. The teacher is also expected to be a *good teacher*, to be a model for his/hers students, to animate students, and to present them their subject (field) in an interesting way and to motivate them to learn. Due to the amount of daily obligations, the teacher often does not have time, and therefore no will to try something

new. According to the European Commission report (2013), 70% of teachers in the European Union recognize that digital technologies are important for education but only 20-25% of them apply them in teaching. Most teachers use ICT for teaching and less to work with students and students. The reason is that they lack the necessary competences for the pedagogical use of ICT in teaching (European Commission, 2017). It is also stated that 70% of teachers in the European Union want to advance in ICT skills as they need them for their profession. A similar conclusion is also given in the OECD report (OECD, 2016), which brings the results of international research on teaching profession (TALIS), and states that only 37% of teachers often use ICT in teaching. Such a small percentage is attributed to the lack of competencies of teachers to apply ICT in teaching. When a teacher feels competent, he/she will be more inclined to try new teaching methods. Competence and motivation are closely related, so greater competency leads to greater motivation to try out the new things and apply new methods of teaching. In the initial teacher education, particular emphasis should be placed on teaching methods based on digital technologies (digital pedagogy).

Teacher training is often absent because it is presumed that besides they are experts in the subject they teach, they automatically know how to teach. There are still some universities where is presumed that teachers do not need to be trained in teaching. In addition to initial training at the beginning of work in a higher education institution, it is important to provide the teacher with continuous training (professional development) in teaching (Selwyn, 2008). Still, we face today the policies that it is teacher's decision (whether to improve and what), although it should be also the responsibility of the institution he/she is working on. If there are some teacher training programs, they are mostly not compulsory, especially when it comes to training in information and communication technologies. According to a joint study by the European Commission and the OECD (2014), six out of ten teachers did not have any courses on the use of ICT in the classroom. Continuous teacher training enables the acquisition of the competences of digital pedagogy and the ability to monitor technology development. The most recent OECD report (2016) states that continuing training of teachers should be the responsibility of each European country, but in practice it is mostly optional. Also, the latest EDUCAUSE (EDUCAUSE, 2018) report on higher education highlights the advancement of the teaching profession as one of six categories that reflect the most current themes in higher education. The report states that educational institutions often place research beyond teaching and therefore teachers are not always sufficiently motivated to improve their teaching nor rewarded when they are innovative and use new methods and teaching technology. The Report emphasizes that programs that recognize good teaching are essential as well as continuous improvement of teachers in digital skills with the support of their institutions.

Some teachers are still afraid of applying ICT in teaching, fearing that they will be replaced by technology and will no longer be the only knowledge transferor (Klein & Godinet, 2000). Technology will not replace a teacher or make it too redundant, but he can do his role different and improved than before. Today we are more often talking about a teacher as mentor and mediator who leads the student through the educational process, especially in the model in which the student is at the centre of the educational process. Increasing focus on the

ISBN 978-615-5511-25-7

learning process is therefore the role of the teacher to encourage this process and to set up a learning environment where, together with the student, he contemplates and comments on the subject and acts as a mentor instead of focusing on the lectures. In this process, students become active participants who are responsible for their learning achievements, and the teacher using innovative teaching methods encourages the student and motivates him to engage, investigate and think, and builds new knowledge based on the information gathered and gains new skills.

Noor-Ul-Amin (2013) states that the application of ICT in the education process can be divided into two broad categories: ICT for education and ICT in education. ICT for education refers to the development of ICT especially for the needs of teaching and learning, while ICT in education includes the use of ICT in the education process. Zhao and Cziko (2001) cite three conditions that are necessary to introduce ICT in teaching: teachers need to believe in the effectiveness of ICT, that application of technology will not cause some disruption in teaching and that they have control over technology.

In their work on the readiness of teachers and teaching materials for e-learning (Lazić et al., 2013) conclude that teachers today need the skills that will enable them the application of ICT in teaching in combination with expert knowledge in a particular area. Therefore, the competences that teachers need for online teaching, for the design and distribution of teaching materials and work with the e-learning system are important for the entire education system. Teacher training and ability of teachers to adapt to time and changes in the environment are directly related to the status of education and educational institutions. Bates emphasizes that digital skills should be an integral part of the course or domain of knowledge (Bates, 2009). Therefore, there are implications for setting up curricula (what to teach), teaching methodology (how it is taught or learned) and evaluation (what is being tested). In cases where any of these areas are not adequately resolved in terms of skills and competences, then teaching is unlikely to be realized in the sense of meeting the 21st century learning goals.

In response to teachers needs what digital competencies do they need, in December 2017, the European Commission adopted a framework for digital competences of educators – DigiCompEdu (Redecker, 2017) with the aim to describe specific digital competences for educators. The framework brings 22 core competencies divided into six areas – professional engagement, digital resources, evaluation, teaching and learning, empowerment of students / students, and support for students in acquiring digital competencies. The framework also proposes a progressive model that will help teachers evaluate and develop digital competencies, and emphasizes six different phases that are typical for the development of digital competence of teachers. Besides this framework, there has been other researches dealing with this topic providing useful information, guidelines and tools for teachers (i.e. Pozos Perez & Torello, 2012; Erasmus+ project MENTEP–Mentoring Technology Enhanced Pedagogy (http:// mentep.eun.org/home); Erasmus+ project Educa-T – Emphasis on developing and upgrading of competences for academic teaching (http://educa-t.hr)).

ISBN 978-615-5511-25-7

Research

The aim of the research was to determine attitude of teachers towards e-learning and what digital competence they need to apply e-learning in a quality manner in the educational process. The research also sought to find out how much the lack of or possession of digital competences influences teachers' readiness as well as their motivation to integrate new technologies into the educational process. The research included principally teachers from the University of Zagreb, but also other teachers using the central e-learning system in higher education (Merlin). The online survey was conducted in the November 2017. The survey comprised of 29 questions which were divided in three sets:

- Teachers' attitude towards new technologies in education and technology and tools used by teachers in teaching;
- Support to teachers in working with technologies;
- Teachers' trainings and digital competences for ICT application and e-learning in teaching.

In order to avoid misunderstanding, definitions of the two most important concepts used in the survey – the concept of e-learning and the concept of digital competence were provided.

The survey included 474 teachers. Of these, 423 teachers (89.2%) were from the University of Zagreb and 52 from other institutions in the higher education system in the Republic of Croatia. The survey was attended by teachers from 33 of 34 members of the University of Zagreb. The total number of participants in the survey was attended by 196 men and 279 women. Women accounted for 58.9% of the survey respondents.

Results

According to the survey results, 90.1% of teachers have a positive attitude towards ICT and e-learning in teaching, 9.1% are reserved and only 0.8% of them has a negative attitude. Most of the teachers (63.7%) believe that e-learning is important while 34.9% think it contributes but not significantly. Also, high number of the teachers (68.1%) believe that the state at their institution is favourable or extremely favourable for the application of e-learning and 61.0% of them think that the conditions (equipment for computers, the Internet) for e-learning and ICT use in education at their institution are good or very good.

When asked about an e-component in their courses 84.8% of teachers answered positively. Teachers who have not the e-learning component in their course named following reasons for that:

- lack of time (30.5%),
- their work in e-learning is not evaluated (neither in teaching nor in their professional advancement (27.6%),
- that e-learning is not relevant to their e-courses (19.0%),
- not being sure that e-learning can improve the quality of teaching (13.3%).

ISBN 978-615-5511-25-7

Of these, 38.8% responded that they plan to implement e-learning in the future. Teachers who do not use e-learning in teaching can be encouraged to use it primarily with:

- available and systematic support to teachers in applying new technologies at university level (20.3%),
- recognition of their effort and innovativeness in teaching (using e-learning) in their professional advancement (18.2%),
- availability of professional trainings in the application of new technologies at university level (16.7%),
- examples of good practice (13.5%),
- if the institution decides that e-learning is compulsory (10.4%).

Teachers who use e-learning in their teaching use it mostly as the classroom aids (62.9%), as a blended learning (34.1%) and only 3.0% of have fully online courses.

Teachers who have participated in the survey, use ICT and e-learning to set up content online and to distribute teaching materials (24.6%), which allows students access to content anytime from anywhere. Also online material is easier to maintain and update, so teachers can provide students with the latest information and educational content. It is very easy to use materials from previous years and to adapt to current needs. Teachers also use e-learning for the information about the course and during the course (23.5%), which is very important because they no longer need to put the notice at the bulletin board a few days earlier, which means that a student must come physically to faculty to read it. Teachers see the benefits of ICT and e-learning in better communication with students and students (19.8%). The availability of teachers to students in online environment is much greater than in face-to-face consultations and can enhance communication between teacher and student. Teachers are to determine how much and when they will be available online so that it does not become too heavy burden on them. A smaller number of teachers (12.1%) use e-learning to evaluate and grade student work and for feedback to students on their progress in the course (11.0%). Only 8.9% of teachers use e-learning for the group work. Teachers use mostly e-mail (24.8%), e-learning platform Moodle (23.3%) and web pages (19.2%) in their teaching. All other technologies are presented in percentage less than 9%.

Part of survey was focused on teacher training in ICT and e-learning. Teachers were asked do they need professional training in ICT and e-learning, have they been involved in training and in what way, what motivates them to train and which obstacles they face for professional training?

Results in Figure 1 show that majority of teachers need support in use of ICT and in e-learning (84.8% respectively 82.1%) and in preparation and development of e-courses (73.6%). Teachers feel most confident in pedagogical and methodological issues but still 65.0% teachers stated they need such support.

ISBN 978-615-5511-25-7

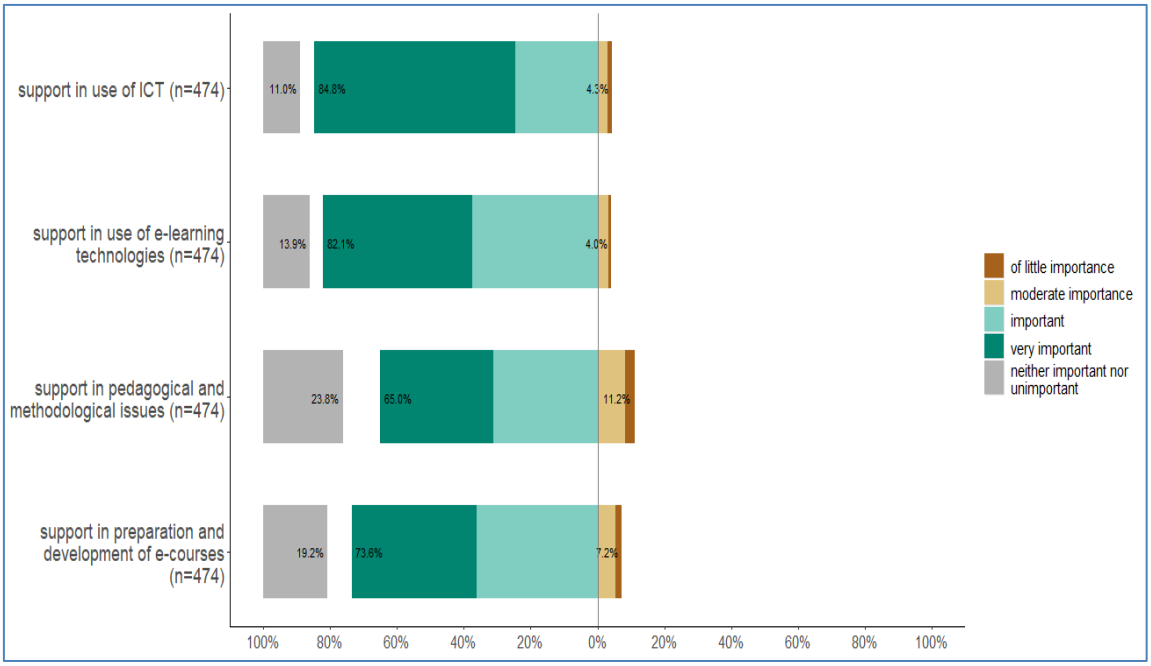


Figure 1. Teachers answer to the question "In e-learning application how important do you find..."

According to the results in Figure 2, most teachers (72.3%) believe that they are digitally competent to apply e-learning in higher education. Nevertheless, more than half of them (59.3%) stated that they need professional training in digital pedagogy, and 48.7% stated that they need training in new technologies.

When talking about education and training programs related to ICT and e-learning that are available to teacher in higher education and meet their needs, majority of teachers (78.0%) responded negatively or did not have opinion. Only small number of them indicated that they are satisfied with available programs. This result indicate that majority of teachers do not know about existing programs, or that they do not meet their needs or that they were not interested in taking some education and training in ICT and e-learning.

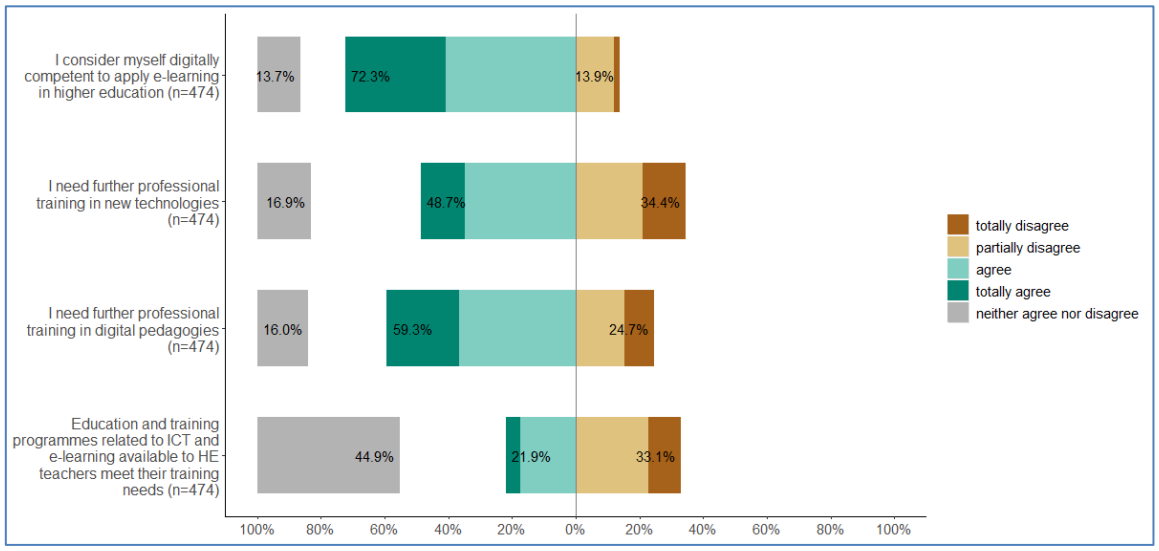


Figure 2. Teachers reply to the question regarding training

ISBN 978-615-5511-25-7

Data in Figure 3 shows that 54.4% teachers, participating in the survey, participated in trainings related to ICT and e-learning technology over the last three years. Of this, majority had less than five training in last three years and only 7.4% took between five to ten trainings. Number of teachers who took more than 10 trainings in ICT and e-learning in last three years in negligible and is 0.8%.

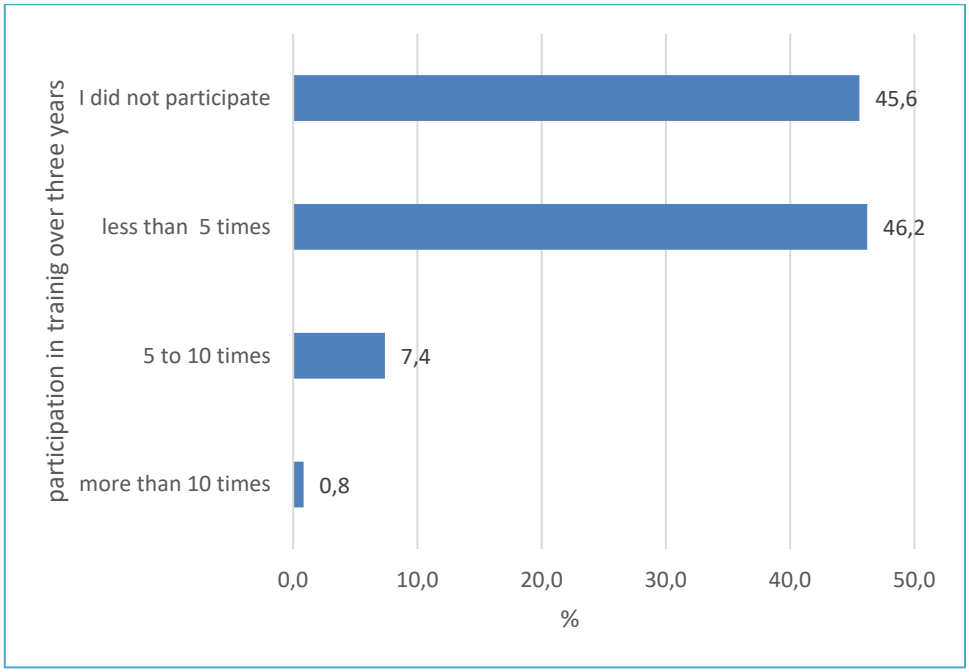


Figure 3. Teachers reply to the question regarding participation in training regarding ICT and e-learning in the last three years

Teachers mostly used training programs in ICT and e-learning available in Croatia (42.8%), 19.7% of them attended training programs in the SRCE, while others were trained in some other educational institutions. Only 6.6% of teachers attended online training programs outside of Croatia.

When asked about the reason for participation in training programs in ICT in e-learning, responses from teachers can summarized into this three reasons:

- personal need for improvement (23.0%),
- improvement of the quality of education (21.9%),
- because of students (21.0%).

A slightly smaller number of teachers (17.7%) as a reason for participating in ICT training programs and e-learning stated improvement the teachers' competence. 7.2% of teachers as a reason for participating in the training program lists the recommendation / request of the institution they are working on and 6.9% state as the reason their career advancement.

Discussion

From the results it can be seen that high number of teachers (90.1%) have positive attitude towards ICT and e-learning in teaching and majority of them believe that e-learning is

ISBN 978-615-5511-25-7

important (63.7%). High number of them (84.8%) have e-component in their courses. But when asked about the use of ICT and e-learning in their courses they are using it mostly on the basic level – access to learning materials, information about and during the course and communication. The formative assessment and feedback, evaluation and grading and group work are very low on the scale. The e-courses should develop and grow from basic level containing information about the courses and repositories of content to higher level which requires a shift in the educational approach from a model that is geared towards the transfer of knowledge of the teacher to the student-oriented model and to the development and acquisition of their competences. In order to do that teachers need support. They need support in use of ICT and e-learning, support in preparation and development of e-courses and also support in pedagogical and didactical issues. Results show that large number of teachers finds themselves digitally competent for e-learning application in teaching and they can identify sort of professional training they need to improve their skills. Still, small number of them took training more than five times in the last years.

In 2016, the SRCE conducted survey on the teacher training in ICT and e-learning at the University of Zagreb (Kučina Softić et al., 2016). The survey investigated how often teachers use ICT tools and e-learning tools and their need for knowledge in these areas for the next two years. The results of the survey indicated that teachers often use the basic operating systems, e-mail and web, and word processing tools, tabular calculations and presentations, followed by cloud storage tools, e-learning and social networking. The least used are video and animation tools, databases, e-portfolio and webinars and programming. It is therefore logical that in the answers they have just expressed the need for such knowledge or their training.

Teachers expressed the greatest need for knowledge on the use of high technology or technologies from these groups:

- multimedia tools: (video production and processing tools – 56.08%; animation tools – 55.35; tools for making or processing vector or raster graphics 53.72%),
- e-learning (e-learning tools – 56.08%; other e-learning tools: e-portfolio, webinars, lecture-recording tools – 51.72%).

Looking at the survey results in 2016 and those in this research it can be seen that they complement in sort of training teachers identified they need further training. But the problem still stays on the issue who will provide these trainings to them and how to enhance them to start using ICT and e-learning in their courses or how to further develop their e-courses.

This results confirms shows the need for teacher training in ICT and e-learning but as well the training in pedagogical and methodological issues. Tailored and continuous trainings can enhance teachers to implement new methods into their teaching, it will enable to be innovative in course design and work with their students.

ISBN 978-615-5511-25-7

Conclusion

The education system in higher education is constantly challenged to offer as much education as possible to as many people as possible, while at the same time developing technology opens up opportunities for new teaching methods.

Application of ICT needs to be carefully planned and put into the pedagogical framework, which requires teachers to have good pedagogical and didactic knowledge in order to apply new teaching methods. It is therefore essential for the teacher to provide continuous training not only in ICT but also in the use of ICT in teaching. Teachers often apply technology in a way that is simply added to classroom teaching and therefore often lacks innovativeness and creativity. Bates and Sangrà (2011) state that this lack of basic knowledge in pedagogy and didactics and continuous improvement in this field leads to the fact that teachers are not innovative in teaching but are in keeping with old traditional models and therefore there is no change in universities. Professional development of teachers at universities should become compulsory if we want to improve the quality of teaching. Also, the use of ICT in teaching will be the beginning as long as teachers perceive new technologies as a threat and as long as their application depends solely on teacher enthusiasm (and accordingly the desire for professional training to know how to implement these technologies in the education process). From ICT we expect a lot, but the impact of ICT on education and training is not at the level that would have been expected so far. The process of changing the process of teaching and learning is still at the beginning. As long as new teaching methods are put in the "old" existing traditional context, there will be no innovative application of ICT in the educational process.

References

1. Bates, T. (2009, June 24). e-Learning and 21st century skills and competences. [Blog post]. Retrieved from https://www.tonybates.ca/2009/06/24/e-learning-and-21st-century-skills-and-competences
2. Bates, A. W., & Sangrà, A. (2011). *Managing Technology in Higher Education: Strategies for Transforming Teaching and Learning.* San Francisco: Jossey-Bas.
3. EDUCAUSE (2018). *NMC Horizon Report: 2018 Higher Education Edition.* Louisville: EDUCAUSE.
4. European Commission (2013). *Opening up Education: Innovative teaching and learning for all through new Technologies and open Educational Resources.*
5. European Commission (2017). *Renewed EU agenda for Higher Education.*
6. Johannesen, T., & Eide, E. (2000) The role of the teacher in the age of technology: Will the role change with use of Information and communication technology in education? *EURODL, 2000.* Retrieved from http://www.eurodl.org/?p=archives&year=2000&article=82
7. Klein, A., & Godinet, H. (2000). The teacher as a mediator in a networked society. *Communication and Networking in Education, 35*, 157-164.

ISBN 978-615-5511-25-7

8. Kučina Softić, S., Jandrić, I., & Rako, S. (2016). *Rezultati ankete o potrebama nastavnika za obrazovnim aktivnostima iz područja ICT-ja i e-učenja.* Zagreb: Sveučilište u Zagrebu Sveučilišni računski centar.
9. Lazić, N., Klindžić, J., & Odak, M. (2013). *Preparedness of teachers and learning materials for e-learning.* Opatija: MIPRO.
10. Noor-Ul-Amin, S. (2013). *An effective use of ICT for Education and Learning by Drawing on Worldwide Knowledge.*
11. OECD (2016). *Skills for Digital World. 2016 Ministerial meeting on the digital Economy. Background Report.*
12. Pozos Perez, K. V., & Torello, O. (2012). The digital competence as a cross-cutting axis of higher education teachers' pedagogical competences in the European higher education area. *Procedia- Social and Behavioral Sciences, 46*, 1112-1116.
13. Prensky, M. (2005). Digitalni urođenici, digitalne pridošlice. *Edupoint časopis, Prosinac, 40.*
14. Redecker, C. (2017). *European Framework for the Digital Competence of Educators: DigiCompEdu.* Luxemburg: European Commission, JRC.
15. Selwyn, N. (2008). The use of ICTs in education and the promotion of social inclusion: a critical perspective from the UK. *Educ. Soc., 29*(104).
16. Zhao, Y., & Cziko, G. A. (2001). Teacher adoption of technology: a perceptual control theory perspective. *Journal of Technology and teacher Education, 9*(1), 5-30

ISBN 978-615-5511-25-7

Towards Personalized Guidance and Support for Learning
Proceedings of the 10th European Distance and E-Learning Network Research Workshop, 2018
Barcelona, 24-26 October, 2018
ISBN 978-615-5511-25-7

THE DESIGN OF A RUBRIC FOR DEFINING AND ASSESSING DIGITAL EDUCATION SKILLS OF HIGHER EDUCATION STUDENTS

Herve Platteaux, Emanuelle Salietti, Centre NTE DIT – University of Fribourg, Laura Molteni, University of Fribourg, Switzerland

Summary

The usage of rubrics is nowadays a developing trend in the world of Higher Education. One can think about two main reasons for this. First, even if there is no definitive proof, rubrics seem to be adequate for supporting the learning of complex skills, in particular for formative assessment. Rubrics are then finding a natural place in HE institutions in the context of the 21st Century where digital education skills become more and more important and need to be well defined and assessed. Secondly, rubrics are based on very easy principles and this simplicity may contribute to the trend noted.

However, our experience of doing rubrics for defining and assessing the students' digital education skills revealed us that the design of rubrics needs its basic principles but also additional rules in order to make a rubric that can be used as an efficient assessment tool. In this perspective, we decided to compile and explain in this article the rules that we have applied during our rubric design work. Some rules were found in the literature; other ones were elaborated during our work progression. With this compilation, we want to bring the reader concrete guiding elements and steps for the design of rubrics. A general rule seems to emerge from our work: a rubric maker should always try to distinguish between all the aspects of the competences needed to perform a task and all the aspects of all the different levels that can be seen in the competences of a person who is performing the task.

Introduction

When joining a university cursus, students usually have a previous experience with a few computer tools such as Word, PowerPoint and entertainment social media. But they have to further develop their digital skills in order to learn their student job. The 21st century context makes digital education always and everywhere present in Higher Education. Then the Personal Learning Environment (PLE) of students is changing radically over the first semesters of their life at University. The pedagogical and technological aspects of their PLE change because of all digital skills that students have to develop for their learning tasks and for a good use of computer tools that can help to perform these tasks.

Concretely, students need to learn how various learning tasks, linked to their course activities, must be performed in the academic world (research of thematic information, academic

document writing and team collaborative working, etc.). For example, in order to do a good thematic research of information, they have to learn and use concepts like "information validity". Students also need to learn how to complete their computer and network know-how by developing usages of new features and new tools, usually unknown from young students. For example, they have to learn how to manage in Learning Management Systems, in scientific online databases and with bibliographical managers.

To help the students to learn about these multiple facets of digital education, we developed a competence framework that is structured on the description of the student learning tasks, with their usual steps and finalities, and on the proposition of the computer tools that can help students performing these tasks. The delivery of these description of tasks and propositions of tools, taking the form of an online guide (myple.ch), was the first achievement of a student support project at the University of Fribourg. A second achievement was the creation of a competence framework, written as a series of rubrics. With these rubrics, we want to propose, for all the tasks documented in myple.ch, a detailed competence description and a formative assessment tool (Platteaux, Sieber, & Lambert, 2017). With these resources, we aim to help guidance of individual students for developing their digital competences and for identifying their individual strengths and weaknesses.

This first version of our rubric leaded our team to the identification of a few defaults that can be overpassed when writing the rubric in order to make it an efficient assessment tool. The aim of this article is to present the analysis of these defaults and the solutions that were found to counterbalance them. Through this analysis, our article wants to be very pragmatic, to show principles and examples about rubrics taken from the scientific literature, and from our own work, and to bring guidelines that could bridge theoretical principles and concrete work results for the doing of a rubric. We are placing thus our work in the perspective of a recent claim:

> *"One of the major causes for problems in rubric design is that there is very little research on how to formulate clear, meaningful, unidimensional and differentiating dimensions that are used to describe skills' mastery levels" (Rusman & Dirkx, 2017; p.4).*

Analysis of rubrics' design, between a free simple shape and constraining rules

Recent works showed that the term rubric is used with many meanings (Dawson, 2015). Then, to introduce our analysis with a clear notion, we refer to the following two simple definitions of rubrics:

Global definition:

> *"A rubric has three essential features: evaluative criteria, quality definitions and a scoring strategy" (Popham, 1997; p.72);*

ISBN 978-615-5511-25-7

Operational definition:

> *"A rubric is a matrix containing the various factors of an assignment along one dimension (rows) and descriptors of the qualitative levels of accomplishment along the other dimension (columns)" (Anderson & Mohrweis, 2008; p.85).*

With such definitions, one can understand that the free basic shape of rubrics is advantageous for the description and the assessment of skills that are needed to perform a task:

- Natural basic structure: the two dimensions of the rubric structure favours a natural construction where lines show the aspects of a task (the evaluative criteria) and columns show the levels of accomplishment (the quality definitions);
- Convenient for substructures: different substructures can be easily built up and presented, by separating or regrouping series of lines and/or columns;
- As many lines as wished: the different activities of the described task, and/or their associated skills, can be explained with the desired number of details;
- As many columns as wished: the number of accomplishment levels can be chosen freely, ie. the desired precision of the assessment scale.

This freedom of design and this simplicity of rubric attract many educators who are looking for assessment tools. In particular rubrics are more and more present in educational institutions, in the context of the 21st century skills' development, because "rubrics are used as an instrument to support learning complex skills in schools" (Rusman & Dirkx, 2017; p.1). More precisely, authors like Lowe and her colleagues, working about the Information Literacy skills, assert the power of rubrics because they allow for objective, authentic assessment of student work: "Rubrics make clear to students the expectations of their instructors and provide consistent and transparent performance criteria" (Lowe, Booth, Stone, & Tagge, 2015; p.492). Other authors emphasize the need for more research to better understand how much the formative use of rubrics impacts learning (Greenberg, 2015).

Then the problematic of the rubric use is in the educational world: how can rubrics help the learning of complex competences and its assessment? With this perspective, the main aspect to be understood in the rubric design is perhaps not its matrix shape: "It may turn out that it is not rubrics per se (that is, rubrics as an assessment tool in a particular form), but the provision of focused learning goals, criteria, and performance descriptions in whatever form that supports learning and motivational outcomes for students" (Brookhart & Chen, 2015; p.364). With this in mind, we want here to review, in the literature and in our experience, the rules that can be listed for the writing of rubrics' evaluative criteria and for the definition of rubrics' quality scales.

Here below are the rules that we have found about the skills' evaluative criteria:

ISBN 978-615-5511-25-7

- Popham underlines how the task description writing is central: "the rubric's most important component is the set of evaluative criteria to be used when judging students' performances" (1997; p.73).
- For the writing of skills, it is very helpful to use, as a basis, the description of the associated task and, in addition, to establish a clear hierarchical cascading structure of the task, of its activities and of their actions (with the corresponding competence, skills and sub-skills). This structure simplifies much the work of design (our experience).
- The wording of skills is very important: "a balance between generalized wording, which increases usability, and detailed descriptions, which ensure greater reliability, must be achieved" (Rusman & Dirkx, 2017; p.3).
- "The purpose of internal validity evidence is to demonstrate the relationships among the criteria within a rubric." (Brookhart & Chen, 2015; p.355).

Here below are the rules that we have found about the skills' evaluation scales:

- The scoring strategy can be holistic or analytic (Popham, 1997; p.72):
  - "Using a holistic strategy, the scorer takes all of the evaluative criteria into consideration but aggregates them to make a single, overall quality judgment."
  - "An analytic strategy requires the scorer to render criterion-by-criterion scores that may or may not ultimately be aggregated into an overall score."
- "Rubrics can contain detailed grading logic, with numbers and even formulae; alternatively they can have no numbers, and be suggestive of broad quality levels" (Dawson, 2015; p.3).
- "For the scale to be generic enough to be applied in a variety of university courses, the descriptors need to refer to a spread of performances at each level. On the other hand, there is a risk that these statements may be too general and thus lead to inconsistent interpretation of the data" (Simon & Forgette-Giroux, 2001; p.105).
- "The levels in a rubric should be parallel in content, which means that if an indicator of quality is discussed in one level, it is discussed in all levels" (Rusman & Dirkx, 2017; p.3).
- "The consistency between the dimensions used within the performance indicator descriptions within and across rubrics was quite poor. Most rubrics used words signaling a mastery level only in one or two performance indicators per constituent sub-skills. Also across rubrics, many different verbal qualifiers or signaling words were used to describe the same scales" (Rusman & Dirkx, 2017; p.7).
- The number of levels in evaluation scales, who is right?
  - If the rubrics have few levels, there is a decrease of the assessment quality because: "People usually avoid extreme positions so a scale with only a few steps may, in actual use, shrink to one or two points" (Bandura, 2006; p.311);
  - A few assessment levels and a good differentiation between the levels maintain the assessment reliability (Berthiaume & Rege Colet, 2013).
- Rules and existing data can help much the choice of the adequate verbal qualifiers for the definition of a good evaluation scale (Rohrmann, 2007).

ISBN 978-615-5511-25-7

Application to the creation of a rubric for digital education skills of higher education students

At the beginning of the work presented in this article, we had a first version of a competence framework written as a rubric designed as a table and for a use that Dawson calls "Quality definition", where each cell defines "a particular evaluative criterion at a particular quality level" (2015; p.8). Also, in this case the evaluation strategy is holistic, according to Popham (1997). Figure 1 shows how our rubric was structured. One can see that the quality level was based on a three level scale. The competences needed to perform a complete learning task (for example: Writing an academic paper) was described by a series of tables, each table dedicated to a competence needed to perform an activity of the task (for example: Structuring a written document with a table of contents). Finally, every single line of a table was focused on a skill that can be mobilized to perform an activity (for example: Making an automatic table of contents in Word).

Activities	Actions	Level 1 "discover"	Level 2 "try and choose"	Level 3 "deepen"
Competence 1 for Activity 1	Indicator 1.1 for Action 1 of Activity 1	Description of every action at every level of competence C1 written with 2 types of evaluation criteria: • management of information • use of device		
	Indicator 1.2 for Action 2 of Activity 1			
	Indicator 1.3 for Action 3 of Activity 1			

Figure 1. Original rubric structure of our competence framework (Platteaux et al., 2017; p.3065)

In this first version, we identified three main defaults in the rubric cells: (a) not systematic description of the skills, (b) mixing of information elements that are descriptive and evaluative; (c) the three levels' scale does not allow the efficient assessment of the skills associated to the cells.

The article considers in the following lines how we improved the first version of our rubric. Doing this, we would also to link design principles of rubrics with concrete examples of rubrics illustrating how principles can be applied.

Let's see first how we improved the systematic description of the skills. Our main problem in the version 1 was a lack of consistency in the description of the different skills of each activity. More precisely, we noticed that is was very difficult to write different accomplishment levels of the same skill. Very concretely, there are two problems: (a) it is difficult to write the absence of a skill (for the low level cells) and (b) it is difficult to initiate and maintain consistency of the evaluation levels when the described skills have different sub-skills that are logically linked to different evaluation scales.

Then we decided to rewrite every skill of an activity in three steps: (a) regrouping all the description elements of the skill, (the elements that were dispersed in the version 1 through the different level cells); (b) listing of all the sub-skills of the skill (two types: knowledge and know-how) and (c) writing of the *upper level* of the skill.

ISBN 978-615-5511-25-7

We insist here on how much the second step helped us to progress towards a complete and clear description of all needed skills. Indeed, educators are used to think with actions of learners, linked to knowledge and/or know-how. Knowledge and know-how are then good helps for finding all the sub-skills of a skill. Furthermore, for a competence framework about digital skills, it is also really helpful to think about knowledge and know-how that are linked either to the computer tools, and their features, and either to the learning task itself.

We do advice also any rubric designer on the importance of the step 3, it means to target the achievement of an *upper level* skill description. With *upper level*, we mean that the rubric designer should first assemble all the skills that are mobilized by a student who is perfectly performing the activity. If you have such a result in front of your eyes, you can think about evaluation scales and skill levels. On the contrary, if you try to write down all the different levels of achievement of a skill that is not well defined, you are in trouble (methodological trap).

We see this trap like the cause of the second main default of our rubric version 1. It consists mainly in the mixing of two types of information: (a) description elements of the skills needed to perform a task activity and (b) definition elements of the assessment scale(s) for these skills. For our competence framework, our experience revealed that a clear way to distinguish the two types of information is to think to them as follows:

- If information refers to the task, for example a particular tool that can be used to perform this activity, this informative element is a description element of the task. It is then turned into a skill for a competence framework like in the following example:
  - The student can use the computer text treatment tools;
- If information refers to the way an individual person is able to perform a particular step of the task or to use a tool that can help to perform this step, this informative element must be taken into account in order to set the evaluation scales and the skill accomplishment levels. Usually such information is qualitative of quantitative, such as in the following examples:
  - The student can use four computer text treatment tools;
  - The student can use very well the computer text treatment tools;
  - The student can use all the principal features of the computer text treatment tools.

Concerning the third default of our rubric version 1, the solution that we have built can be said shortly: we turned to an analytic scoring strategy. Indeed, our analysis of the third default was enhancing different points:

- Many students using our rubrics were never choosing the lowest level, in any skill. By having 3 levels only, our assessment tool precision was decreasing much.
- Many times, students were telling us: "I feel to be between two levels" or, more precisely, "For this aspect of the skill, I feel to be at level 2. But, for this other aspect, at level 3." We

ISBN 978-615-5511-25-7

then thought that different evaluation scales for different evaluation criteria was a better scoring strategy.

- We analysed the time spent by students to answer all the questions of a rubric. This was significantly less than what was necessary to read the descriptions of the skill levels. It was obvious that our students were not reading all the descriptions, but perhaps just the title of the activity competence, before to evaluate themselves. Then we were doubtful about the evaluation quality obtained with such a rubric.

On this basis, concerning the scaling strategy, different transformations were operated on our rubric version 1. Many of them were inspired by the idea of dimension as expressed by Rusman and Dirkx (2017) who emphasize that three performance indicators are commonly used: amount, frequency and intensity.

Let us also underline that, at this stage of the rubric design, there can be a few roundtrips between the writing of the skills and the set-up of the evaluation scales. The roundtrips done must increase the coherence and the operational aspect of the skills and of the evaluation scales. Then this stage of design has implications and/or depends on a specific skill but also on the whole rubric. The choices to make are different if the scaling strategy of the rubric is supporting a more qualitative, or quantitative, evaluation approach. The example below, extracted from our work where we have chosen mainly a writing 2 type, will clarify what we are discussing now:

- Writing 1 of a know-how skill: To know how to use various selection criteria in order to decide if a document, found with a request in a bibliographical database, meets the needs of an information retrieval task;
  - Evaluation scale 1: The rubric can propose the student to evaluate what type of action he is usually doing during this activity, for example by using the revised Bloom's taxonomy (Krathwohl, 2002): to apply, to analyse, to evaluate, to create. We have then set a qualitative evaluation for this criterion.
- Writing 2 of a know-how skill (more operational): To know how to analyse a document, found with a request in a bibliographical database, according to various selection criteria in order to decide if the document meets the needs of an information retrieval task;
  - Evaluation scale 1: The rubric can propose the student to evaluate how much help he needs to perform the analysis described in the skill or how often he is performing such an analysis when adopting or rejecting a document. We have then set a quantitative evaluation for this criterion.

After this phase, aiming at choosing the exact skill for an evaluation criterion and at defining the associated type of scale, we used the considerations that are validated for defining *verbal qualifiers* (Rohrman, 2007; p.11):

> *"(1) appropriate position on the dimension to be measured; (2) low ambiguity (i.e., low standard deviation in the scaling results); (3) linguistic compatibility*

ISBN 978-615-5511-25-7

> *with the other VSPLs chosen for designing a scale; (4) sufficient familiarity of the expression; (5) reasonable likelihood of utilization when used in substantive research."*

Then, by using the quantitative analysis done by the same author, we obtained for our scales:

- Intensity qualifiers for a 6-point scale: not at all, a little, partly, quite, very, extremely;
- Frequency qualifiers for a 6-point scale: never, rarely, sometimes, fairly often, very often, always.

Conclusions and perspectives

We focused this article about concrete facets of the rubrics' design. To summarize our experience, we can recommend a design of such assessment tools that follows the steps presented in the Table 1.

Table 1: Steps for the design of a rubric

Design steps	Work to be done	Expected results
Task writing	To write down the task, with its different usual chronological activities (steps) and for each of them: their finalities, main learning concepts and main computer and methodological tools to be used when performing the activity, tricks and traps.	A comprehensive overall view of the whole task. A comprehensive view of the diverse activities composing the whole task. A good understanding of the resources needed to perform the task (concepts, tools, etc.).
Skill listing	To define the main competence associated to each activity and to create the list of the skills that are "the constituents" of the competence. To do a listing, for each skill, of its sub-skills by using the two types: knowledge and know-how.	All the aspects of the task transformed in a list of skills and sub-skills that are mobilized when somebody performs the task. All the information elements that make it possible to set the evaluation scales and the skill levels.
Scaling strategy	To choose between a more or less qualitative or quantitative scaling strategy and more or less operational skills.	All the evaluation information transformed in the various necessary evaluation scales and skill levels.

As a conclusion, it seems to be that rubrics were mostly used with their basic matrix shape where a single skill evaluation scale is used and based only on a few accomplishment levels. The simplicity of a few rubric principles perhaps damaged the educational potential of rubrics, deeply related to assessment. However, it is possible to take advantage of different rules to make the rubrics less simple but more efficient. We have found a few of them but we were surprised about the fact that the literature about rubrics seems to be poor in the rules about skill description. More information can be found about the scaling strategy. This is an axis for future research about rubrics because the skill description and the scaling strategy are

ISBN 978-615-5511-25-7

deeply linked, as we showed in this article. Other authors concluded: "a literature that is beyond its infancy but not yet mature." (Brookhart & Chen, 2015; p.362).

References

1. Anderson, J. S., & Mohrweis, L. C. (2008). Using Rubrics to Assess Accounting Students' Writing, Oral Presentations, and Ethics Skills. *Journal of Business Education, 1*(2), 85–94.
2. Bandura, A. (2006). Guide for constructing self-efficacy scales. In T. Urdan & F. Pajares (Eds.), *SelfEfficacy Beliefs of Adolescents.* IAP.
3. Berthiaume, D., & Rege Colet, N. (2013). Comment développer une grille d'évaluation des apprentissages? In D. Berthiaume & N. Rege-Colet (Eds.), *La pédagogie de l'enseignement supérieur: repères théoriques et applications pratiques* (pp. 269–283). Peter Lang.
4. Brookhart, S. M., & Chen, F. (2015). The quality and effectiveness of descriptive rubrics. *Educational Review, 67*(3), 343–368. https://doi.org/10.1080/00131911.2014.929565
5. Dawson, P. (2015). Assessment rubrics: towards clearer and more replicable design, research and practice. *Assessment & Evaluation in Higher Education, 42*(3), 347-360. https://doi.org/10.1080/02602938.2015.1111294
6. Greenberg, K. P. (2015). Rubric Use in Formative Assessment: A Detailed Behavioral Rubric Helps Students Improve Their Scientific Writing Skills. *Teaching of Psychology, 42*(3), 211–217. https://doi.org/10.1177/0098628315587618
7. Krathwohl, D., R. (2002). A Revision of Bloom's Taxonomy: An Overview. *Theory into Practice, 41*(4), 212–218.
8. Lowe, M. S., Booth, C., Stone, S., & Tagge, N. (2015). Impacting Information Literacy Learning in First-Year Seminars: A Rubric-Based Evaluation. *Portal-Libraries and the Academy, 15*(3), 489–512. https://doi.org/10.1353/pla.2015.0030
9. Platteaux, H., Sieber, M., & Lambert, M. (2017). A competence framework of the student's job: helping higher education students to develop their ICT skills. *Proceedings of INTED2017*, 3064–3071. Valencia Spain – 6-8 March, 2017. IATED. Retrieved from https://library.iated.org/publications/INTED2017
10. Popham, W. J. (1997). What's Wrong – and What's Right – with Rubrics. *Educational Leadership, 55*(2), 72–75.
11. Rohrmann, B. (2007). *Verbal qualifiers for rating scales: Sociolinguistic considerations and psychometric data.* University of Melbourne. Retrieved from http://www.rohrmannresearch.net/pdfs/rohrmann-vqs-report.pdf
12. Rusman, E., & Dirkx, K. (2017). Developing Rubrics to Assess Complex (Generic) Skills in the Classroom: How to Distinguish Skills' Mastery Levels? *Practical Assessment, Research & Evaluation, 22*(12). Retrieved from http://pareonline.net/getvn.asp?v=22&n=12

ISBN 978-615-5511-25-7

13. Simon, M., & Forgette-Giroux, R. (2001). A rubric for scoring postsecondary academic skills. *Practical Assessment, Research & Evaluation, 7*(18), 103–121.

ISBN 978-615-5511-25-7

Towards Personalized Guidance and Support for Learning
Proceedings of the 10th European Distance and E-Learning Network Research Workshop, 2018
Barcelona, 24-26 October, 2018
ISBN 978-615-5511-25-7

RETHINKING ASSESSMENT POTENTIAL IN MASSIVE OPEN ONLINE COURSES TO SUPPORT STUDENT LEARNING: THE EXPERTS' POINT OF VIEW

Maite Fernández-Ferrer, Universitat Oberta de Catalunya, Spain

Summary

In recent years, the need to rescan distance education as a future strategy for higher education institutions has been called for. 2012 was the year in which Massive Open Online Courses were the trend for excellence in the world of online education, and from 2013, they began to find themselves among the emerging technologies on the horizon for the following years, and as a learning modality that represented an important development in open education. Thus, MOOCs are presented as an appropriate, current and emerging topic and, moreover, they are of great importance and relevance in the context of learning designs in higher education. This paper specifically focuses on the subject of assessment for learning in the context of MOOCs through the findings relating to experts in online assessment interviews with the participation of 13 university professors at Spanish level. These results are divided into two sub headings: the assessment strategies in MOOCs and the strategies, tools and practices for formative assessment from these experts' point of view. Personalized learning, adaptive teaching, formative assessment and feedback are the main and most recurrent themes analysed in the context of this research that is part of a doctoral thesis.

Introduction

Massive Open Online Courses (MOOCs) have generated great interest as agents of change in higher education. Since their inception, these courses have been the subject of educational and pedagogical reflection. They have also generated new debate in the line of these being a new vehicle to experiment, investigate and innovate teaching and new educational models in college campuses, and to better understand how to teach and how to learn in these contexts. In this regard, MOOCs had emerged as an opportunity to rethink learning. This was how this new learning modality has ended up being not only a tool for improving access to education (Fernández-Ferrer, 2017), but also as a key element to improve the teaching and learning process and as a stage to carry out research on how these MOOCs are changing the way teachers teach and students learn.

Indeed, in 2012, the New Media Consortium (NMC) (an international consortium of schools, universities, museums, corporations and other organizations worldwide engaged in the exploration and use of new media and new technologies) already indicated that the new MOOCs would be implemented in higher education institutions in a four-to-five year horizon

(Durall, Gros, Maina, Johnson, & Adams, 2012) and that during 2014, they would be among the technologies having the greatest impact on the university context, together with tablets, video games, gamification, learning analytics, 3D impressions and laptop technology. Then, in 2013, the 9th edition of the Horizon Report (Johnson et al., 2013) particularly emphasized the impact of these Massive Open Online Courses in the current scene, and in 2015, this same learning modality was among the "Top eLearning Trends for 2015" according to the e-learning industry.

In this regard, in 2014, when the presented research began, there was little empirical research on the effects of this new modality in learning and, moreover, its true influence and the possible changes that MOOCs could generate in the educational processes were not highlighted. In this sense, the study presented below covers a space, in the beginning, marked by the lack of knowledge and research, which aims to respond to the initial concerns about this new learning modality and to its relevance in the academic context and in the framework of higher education.

This research specifically focuses on the subject of learning assessment in the context of these MOOCs. From a didactic point of view, assessment in Massive Open Online Courses, and especially the lack of a formative type that provides constant feedback to the participants, has been one of the most criticized by the educational community. In this sense, the question has been raised as to whether these courses could really become educators considering that they do not have guidance, since the presence of a tutor or a teacher to conduct monitoring and immediate feedback is: a true key to learning. This lack of formative assessment in these virtual environments has brought about the implementation of alternatives and the use of new strategies to analyse student activity throughout the course and so providing feedback that could improve their learning processes. For this reason, all of these elements relating to the assessment of learning have endeavoured to be specifically analysed in the context of the study.

Methodology

This paper is part of a doctoral thesis that tries to open a clear line of research that allows the possibility to have real data on the possibilities, limitations and problems of this new learning modality. The main objective of this thesis is to understand the meaning and scope of MOOCs in the context of higher education today pursued through eight specific goals needed to achieve this overall objective. These specific objectives have been responded from the use of the six sources of data collected: bibliographical documental analysis; teachers of educational technology' open questionnaires (27 responses) (Cabrera & Fernández, 2017); experts in Massive Open Online Courses' open questionnaires (20 responses) (Cano García, Fernandez Ferrer, & Crescenzi Lanna, 2015); edX, Coursera, Udacity and Miríada X MOOCs documental analysis (1,401 MOOCs) (Fernández-Ferrer, 2018); higher education students' closed questionnaires (1,425 responses) (Ferrer, 2017) and experts in online assessment interviews (13 responses).

ISBN 978-615-5511-25-7

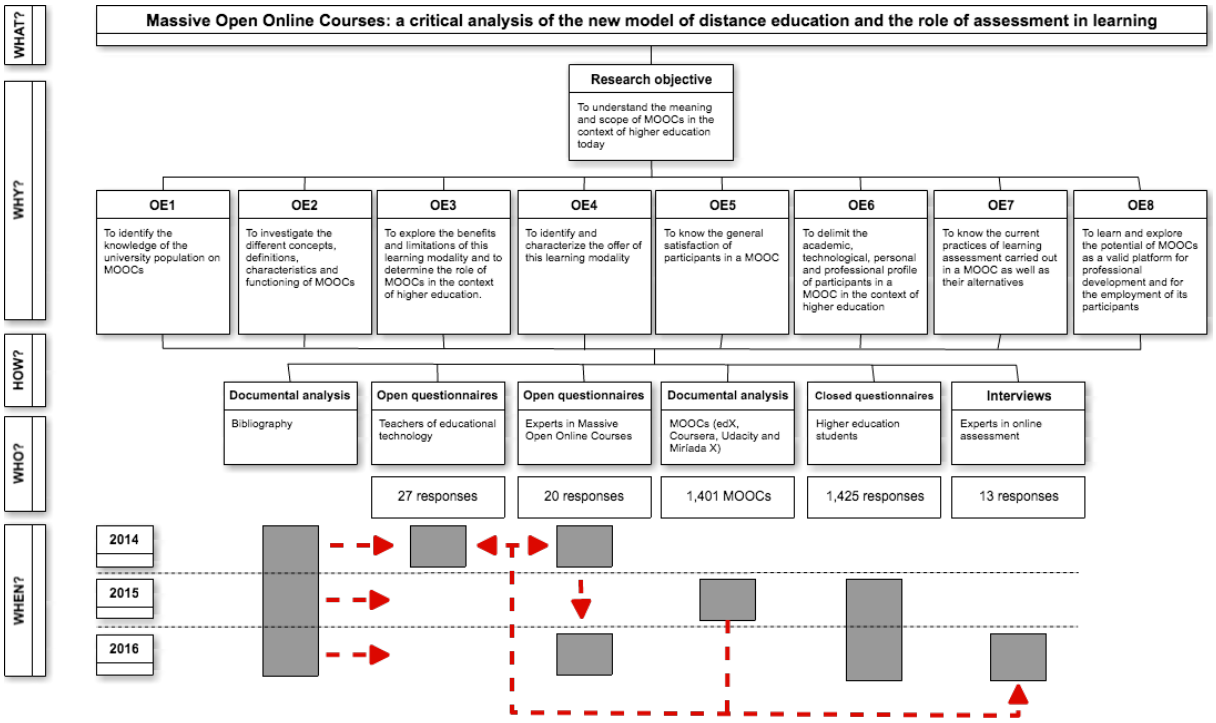


Figure 1. Diagram on the research design

Specifically, the main objective of this paper is to know the current practices of learning assessment carried out in a MOOC as well as their alternatives – the seventh specific objective (OE7) of the doctoral thesis presented above (Figure 1). This part of the research presents the results of the findings relating to experts in online assessment interviews with the participation of 13 university professors at Spanish level. The design of this interview was brought together through the analysis of the results of the first stages of the thesis regarding the topic of learning assessment (both documental analysis and open questionnaires). Those first results were embodied in an infographic to be discussed by the informants during the holding of these interviews.

The qualitative analysis of the contributions of these experts was achieved through the description and interpretation of their contributions and putting their voice as verbatim quotes. The analysis is divided into two sub headings: the assessment strategies in MOOCs (1) and the strategies, tools and practices for formative assessment (2).

Results

Assessment strategies in MOOCs (1)

In relation to the most used assessment strategies (*questionnaires or multiple-choice questions and, to a lesser extent, exercises, assignments or tasks*), through analysing in 2015 the platforms edX, Coursera, Udacity and Miríada X, most experts in online assessment were not surprised. From their point of view, many of these results reinforce the idea that assessment activities used in Massive Open Online Courses were easier to develop and implement with technology, more comfortable and, moreover, consistent with online learning and teaching processes and

ISBN 978-615-5511-25-7

the features of a MOOC (the number of its students and the limited capabilities of designers and teachers in this modality). However, and despite being the most widely used instruments, many of these respondents said that if they continued this line, MOOCs probably would not be considered as student learning. Other experts concluded that this was a typical type of assessment in most cases and not only in MOOCs, being a reproduction of the traditional models of education.

> *(...) I find it very consistent that most are multiple-choice questions and exercises, assignments or tasks. That these two items are the majority I find it consistent with the idea that I have of what online education is, whether it is a MOOC or not (interviewed LL.C.).*

> *I believe that MOOCs, from a methodological point of view, are a repetition of the most classic learning schemes but using new technologies (interviewed G.R.).*

On the other hand, the fact that *projects* appear as assessment activities in some of the MOOCs analysed during 2015 surprised the experts in online assessment, especially regarding the issue of complexity in assessing this type of activity. At the same time, within this concept of the projects, these informants valued similar instruments such as case studies, problem-solving activities and other activities related to entrepreneurship and, in general, in how to apply knowledge, i.e. practical and applied types of projects.

> *And what I am surprised of is the topic of the projects. Because if they are MOOCs linked to professional aspects or which are looking for a specialization in some professional competence, it seems that this is a very interesting strategy to assess students' competencies. What happens is that, possibly, it has a complexity with regard to the assessment and to be able to verify this learning (interviewed J.A.J.).*

Moreover, the experts in online assessment made reference to these *forums* not only as communication spaces but also as environments to develop strategies for peer assessment and to promote, in general, the interaction among the students of the course. Experts in online assessment proposed the registration of participation in these discussion forums as a strategy to enhance formative assessment. In any case, future research should consider whether this activity under the MOOCs context is being used more as a learning activity or as an assessment strategy.

Strategies, tools and practices for formative assessment (2)

The *electronic portfolio* was a recurring strategy between the views of some experts in online assessment. These experts bet on this instrument to gather evidence of learning, and to reflect and attach evidence on the acquisition and development of competencies, which could

ISBN 978-615-5511-25-7

become a validation of the MOOC related to a possible accreditation or badge at the end of the course:

> *The portfolio allows you to gather evidences of everything that you have learned, and you reflect it and reflect on it, commenting and attaching the documents or the evidences you have to show that you have developed those abilities, and in the end (...) it is the document that provides a validation of the MOOC to finally obtain a diploma or a badge (interviewed L.).*

The informants of this research proposed a variety of specific strategies and practices to work towards formative assessment in MOOCs. Online assessment experts introduced the concept of *authentic assessment* reinforcing the need for what is being asked to students to be connected with their intellectual and professional interests (although everyone is different), and being based on reality. This relationship with reality could then be one of the key elements that could make assessment more attractive in the context of Massive Open Online Courses.

Regarding the specific activities, strategies and assessment tools, the online assessment experts in the last phase of this thesis made reference to elements such as *continuous assessment tests*, a report in which to write what they have learned, *role playing* or the *simulators* in which MOOCs' participants could see the consequences of their actions through a more automated assessment. In addition, to the interview held with these experts in online assessment, *rubrics, scales or checklists* (namely, instruments to assess the task) also appeared with the idea that it could help students to orient themselves on how it would be good to do the exercise, what should have been done or what would not be proper conduct. In this sense, these tools could be used to guide the students to self-regulate and not necessarily only to assess the work they have done. In a MOOC, applying the rubric or scale in question, that assessment could be thought up by the teacher or by the peers, that is, through peer review. Therefore, it would involve showing the students the rubric with which they would be evaluated, before requesting the exercise

Furthermore, in relation to these online strategies with a more formative assessment component in the context of MOOCs, the use of *social networks* and, in general, in areas of communication between participants in the learning process appeared in several interviews as a fundamental aspect, and it would be wise to take advantage of all their opportunities. And besides, as an example of the social and participative web (in which one of its key principles is collective intelligence), the wikis (another assessment activity underrepresented by the documental analysis of MOOCs made in 2015) or any tool cropped up that could generate virtual models of collective work.

The experts in online assessment mainly dealt with the issue of *automated assessment*. In this sense, for example, in a multiple-choice questions' activity, automated feedback would be introduced so if the student does not mark a correct answer, the tool automatically informs

ISBN 978-615-5511-25-7

him/her of why it is wrong and why this distractor is not a good option or a right one. Specifically, the experts in online assessment made reference to the initiative of many universities in the use of this information for two different purposes. On the one hand, to get information on how students learn to make institutional decisions or decisions on the design of the course, for example. And, on the other hand, to make pedagogical and educational decisions so that this *Learning Analytics* would allow to have information about students' performances and, at the same time, give feedback to them. In this second line, the interviewed experts in online assessment had no knowledge if whether it was an issue that was being carried out. So it could be argued that using LA to provide feedback to the learner is a proposal that is still standing and that raises many questions around it: how to select what information is needed to analyse; how to really interpret this data; and how to transform the quantitative data provided by the platform to offer this qualitative feedback aimed at improving the quality of students' future tasks:

> *And you make a test, that when you are mistaken automatically the system answerers you why you are wrong, what errors are you committing, etc. I think that it is here where part of the assessment based learning problems could be solved a bit (interviewed M.J.).*

> *This automated assessment I really believe is a problematic issue. I believe that the value of a course is given by the feedback that student can received from the teacher who knows the subject, who is experienced and who can logically offer you this added value that does not give you a much more aseptic and automatic assessment (interviewed J.V.).*

> *It is true that the system can provide information about the tracking process but this information must be interpreted by someone. Because this data itself do not contribute. You always need someone to complement and interpret it from a more qualitative perspective (interviewed M.G.).*

In the case of online assessment experts, many of them pushed for the inclusion of *collaborative learning* activities and for the involvement of the student groups themselves both in the construction of knowledge (peer learning) and in the assessment of their own group (*self-assessment* through self-correcting tests, for example, and *peer assessment*). Peer assessment, according to these informants, was one of the key elements both to help counter the two main limitations of MOOCs according to the results of this study (the massiveness and the lack of formative assessment or the absence of monitoring and immediate feedback), and to strengthen and improve guided self-study amongst students in a MOOC. Beyond this peer review, strategies based on co-assessment should be considered so that the students of this learning modality could self-assess, and also their peers and their teacher or tutor. However, an important group of experts was against this alternative of peer assessment due to several factors related to, for example, the difference in the level of knowledge among one student and another, and in short, between these students and the teacher, an aspect that

ISBN 978-615-5511-25-7

could also appear in online education in general, and even in face to face education. In this regard, some of the proposals that emerged during the interviews in relation to these problems of peer assessment were: to control the number of students for which there is sufficient participation in this assessment; for evaluators to ensure that students have a similar level of education, and to use more quantitative systems to facilitate the work of these reviewers, for example, the rubric.

Finally, in the formula of how to make teachers and teachers' assistants more accessible, online assessment experts raised the solution as a method of payment for registration with complementary assessment actions (like tutorials or the assessment in general) (an element that, according to one expert, has begun to be implemented in some platforms). In the same line, it could be that the assessment and qualification of MOOCs was not mandatory and that if the students wish to have it, they themselves could take care of this cost. However, this would completely degrade the free philosophy of these new environments of distance education:

> *(...) As the student has paid, the costs can be reached that a team and some people look for an exam with guarantees to prove that the student has not only made the MOOC but also has learned what he had to learn (interviewed P.M.).*

Conclusions

The paper presented on the subject of assessment for learning in the context of MOOCs could in the future allow: to make more informed decisions about the design of MOOCs; to improve their pedagogical effectiveness; and to find more motivation for students and start exploring what would be the best way to assess their learning in this new modality. Specifically, these are some key elements that according to the experts' point of view should help to rethink the potential of assessment in Massive Open Online Courses to support student learning:

- We should consider whether another form of assessment in online environments is possible, and how to automate these creations and interactions between students and between students and teachers (Sancho, 2016).
- These results shed light on a new response to formative assessment in the context of MOOC activities of a more qualitative and open nature as long as there is a technology development to carry out these more complex assessment techniques. However, we would be facing the same challenge: once the projects have been requested from the students, for example, how and who could assess them taking into account, in particular, the massiveness of the course?
- The electronic portfolio was a recurring strategy between the views of some experts in online assessment, strengthening the literature that enforces the importance of these strategies such as the portfolio (along with peer review or badges) for the recognition of competencies or achievements (Yuan, Powell, & Olivier, 2014).

ISBN 978-615-5511-25-7

- With the use of automated assessment, many critics emerged based on the possible deterioration of learning and of its personalization, which could convert this assessment strategy in such a problematic issue in line with making a commitment to rather superficial and non-authentic learning.
- In the context of MOOCs, the use of social networks has so far been beyond the competency assessment purpose and have been used to advertise the course for new participants, or as a meeting, exchange or repository of experiences (Calvo Salvador, Rodriguez Hoyos, & Fernández Díaz, 2016).
- In this sense, the results of this research clearly point to the need for new degree programs in data analysis (Ferguson, 2014; Williamson, 2015). It also reinforces this idea raised by all respondents who address the topic that, at present, Learning Analytics is not yet powerful enough or sufficiently developed to obtain the necessary information in order to provide feedback to the student. The reasons could be for impossibility; for a lack of interest; because the platforms have been focusing on providing data to the director of the course to increase the registration' levels or to make decisions about the resources and materials offered; or because it would involve standardizing and returning to the idea of adaptive learning that pedagogy and education already overcome.
- Shedding light on studies such as Ruiz Bolívar (2015) and Calvo Salvador et al. (2016) on the one hand peer review does not always provide a fair and efficient assessment result (which is often a cause of discomfort and protests among the participants of the courses). And on the other hand because of the type of rubric used to assess students' task, and because of the quantity and quality of the feedback received about participants on the work done (Calvo Salvador et al., 2016).
- One of the key formulas in MOOCs should be how to make teachers and teachers' assistants more accessible to students (Jacobs, 2013).

References

1. Cabrera, N., & Fernández, M. (2017). Examining MOOCs: A Comparative Study among Educational Technology Experts in Traditional and Open Universities. *International Review of Research in Open and Distributed Learning, 18*(2). Retrieved from http://www.irrodl.org/index.php/irrodl/article/view/2789/4113

2. Calvo Salvador, M. A., Rodriguez Hoyos, C., & Fernández Díaz, E. M. (2016). ¿Cómo son los MOOC sobre educación? Un anàlisis de cursos de temàtica pedagògica que se ofertan en castellano. *Digital Education Review*, *29*, 298-319. Retrieved from http://revistes.ub.edu/index.php/der/article/viewFile/14680/pdf

3. Cano García, E., Fernández Ferrer, M., & Crescenzi Lanna, L. (2015). Cursos en Línea Masivos y Abiertos: 20 expertos delinean el estado de la cuestión. Encuesta a expertos españoles de tecnología educativa. *RELATEC – Revista Latinoamericana de Tecnología Educativa*, *14*(2), 25-37. Retrieved from https://relatec.unex.es/article/view/1585/1305

ISBN 978-615-5511-25-7

4. Durall, E., Gros, B., Maina, M., Johnson, L., & Adams, S. (2012). *Perspectivas tecnológicas: educación superior en Iberoamérica 2012-2017*. Austin: The New Media Consortium.
5. Ferguson, R. (2014, March 26). Learning analytics don't just measure students' progress – they can shape it. The Guardian [Blog post]. Retrieved from https://www.theguardian.com/education/2014/mar/26/learning-analytics-student-progress
6. Fernández-Ferrer, M. (2017). Democratizando la educacion a nivel mundial: ¿ficción o realidad? El papel de los cursos en línia abiertos y masivos, *Revista de currículum y formación del profesorado, nº Extraordinario*, 445-461. Retrieved from https://recyt.fecyt.es/index.php/profesorado/article/view/59469/36181
7. Fernández-Ferrer, M. (2018). Iberoamérica y los cursos en línea abiertos y masivos: un análisis documental. *REXE. Revista de Estudios y Experiencias en Educación, Número Especial 3*, 115-123. Retrieved from http://www.rexe.cl/ojournal/index.php/rexe/article/view/553/446
8. Ferrer, M. F. (2017). What do higher education students know about massive open online courses? *New Trends and Issues Proceedings on Humanities and Social Sciences, 4*(1), 115-122. https://doi.org/10.18844/prosoc.v4i1.2242 ISSN 2421-8030
9. Jacobs, A. J. (2013, April 20). Two cheers for Web U! NYTimes [Blog post] Retrieved from http://www.nytimes.com/2013/04/21/opinion/sunday/grading-the-mooc-university.html
10. Johnson, L., Adams Becker, S., Cummins, M., Estrada, V., Freeman, A., & Ludgate, H. (2013). *NMC Horizon Report: 2013 Higher Education Edition*. Austin, Texas: New Media Consortium.
11. Ruiz Bolívar, C. (2015). El MOOC: ¿un modelo alternativo para la educación universitaria? *Revista Apertura, 7*(2), 1-14. Retrieved from https://dialnet.unirioja.es/servlet/articulo?codigo=5547138
12. Sancho, J. (2016). Learning Opportunities for Mass Collaboration Projects Through Learning Analytics: A Case Study. IEEE R. *Iberoamericana Tecnologias Aprendizaje, 11*(3), 148-158.
13. Williamson, B. (2015). Digital education policy: big data, visualization and real-time analytics. *Journal of Education Policy, 31*(2), 123–141. http://doi.org/10.1080/02680939.2015.1035758
14. Yuan, L., Powell, S., & Olivier, B. (2014). *Beyond MOOCs: Sustainable Online Learning in Institutions*. Londres: CETIS. Retrieved from http://publications.cetis.org.uk/wp-content/uploads/2014/01/Beyond-MOOCs-Sustainable-Online-Learning-in-Institutions.pdf

ISBN 978-615-5511-25-7

Towards Personalized Guidance and Support for Learning
Proceedings of the 10th European Distance and E-Learning Network Research Workshop, 2018
Barcelona, 24-26 October, 2018
ISBN 978-615-5511-25-7

DIGITAL COMPETENCE ASSESSMENT FRAMEWORK FOR PRIMARY AND SECONDARY SCHOOLS IN EUROPE: THE CRISS PROJECT

Lourdes Guàrdia, Marcelo Maina, Pablo Baztán, Universitat Oberta de Catalunya, Spain

Summary

This paper presents the Digital Competence Assessment Framework for primary and secondary schools in Europe developed in the H2020 CRISS project. A qualitative approach consisting of an integrative literature review and input from experts and teachers from seven European countries was used to validate the construct. The framework adopts the approach of integrative pedagogy for implementation within the school curriculum, structuring learning through competences in various syllabus specifications focusing on the digital competence. It proposes a process based on a set of assessment scenarios that use several methods for gathering learning evidence and implement rules to ensure validity and reliability. In this sense, the scalability and flexibility of the entire proposal is one of the strengths of the system and makes the solution transferable to similar contexts using a Competence-Based Education (CBE) approach.

Introduction

Competence assessment is an essential component in the learning and teaching process and should promote learning as well as measure or certify outcomes (Clements & Cord, 2013). There have been significant changes in the approaches to teaching and learning in secondary schools with the advent of new technologies and the adoption of active pedagogies such as game-based learning, flipped classroom and project-based learning. Whilst ICT have promoted changes in our understanding of how curricula might be designed and delivered, there are few developments focusing on a consistent method to support competence assessment by teachers and intelligent systems (Guàrdia, Crisp, & Alsina, 2016).

To respond to this challenge, CRISS (demonstration of a scalable and cost-effective cloud-based digital learning infrastructure through the certification of digital competences in primary and secondary schools), an H2020 project funded by the European Commission, was born with the goal of developing a solution for the implementation, assessment and certification of the digital competence (DC) within European schools.

A detailed definition of DC suggested by Ferrari (2012; p.3) was adopted in our research: "Digital Competence is the set of knowledge, skills, attitudes (thus including abilities, strategies, values and awareness) that are required when using ICT and digital media to

perform tasks; solve problems; communicate; manage information; collaborate; create and share content; and build knowledge effectively, efficiently, appropriately, critically, creatively, autonomously, flexibly, ethically, reflectively for work, leisure, participation, learning, socializing, consuming, and empowerment". On the basis of this definition, CRISS proposed a Digital Competence Assessment Framework that implements a DC operational concept of five areas and 12 sub-competences with associated performance criteria and indicators.

Although the assessment system proposed by the CRISS project aims to evaluate and certify DC, the proposal can also be applied to other key competences (Guàrdia, Maina, & Julià, 2017). In this sense, its scalability and flexibility is one of the strengths of the system and makes the solution transferable to similar contexts using a Competence-Based Education (CBE) approach.

Competence-Based Education

There is growing interest in Competence-Based Education (CBE), particularly in relation to the assessment of competences. Despite there being several concurrent definitions of a competence (Baartman et al., 2007; Biemans et al., 2004), one of the most comprehensive states that a competence consists of an integrated set of knowledge, skills and attitudes that can be activated in a context to solve a problem or deal with a situation. Therefore, a competence is not only reduced to cognitive elements (theories, concepts and knowledge), but also includes functional aspects (skills), interpersonal attributes (organisational and social capacities) and ethical values (Cedefop, 2008). This notion is also confirmed by a rigorous recent analysis of the best known international competence frameworks carried out by the EU working group for a Council recommendation on Key Competences for Lifelong Learning (SWD, 2018), which concludes that all the studied frameworks "define knowledge, skills and attitudes as key elements of a competence" (p.19).

The challenge of a competence-based approach in education dates back to the 1950s when "CBE was coined as a general concept, based on the ideas of mastery learning and criterion-referencing of assessment. Learning, teaching and organisation should be guided by clearly specified (minimum) competencies to be demonstrably acquired" (Lassnigg, 2015; p.10). However, European education systems have only begun focusing their efforts to introduce CBE into school curricula in recent years.

The European Recommendation on Key Competences for Lifelong Learning promoted a competence-based approach in EU member states' education systems, based on the idea that: "As globalisation continues to confront the European Union with new challenges, each citizen will need a wider range of key competences to adapt flexibly to a rapidly changing and highly interconnected world." (EU, 2006; p. L 394/13). Key competences are defined as "those that all people need for their fulfilment and personal development, for active citizenship, for social inclusion and for employment" (idem) and they are identified as:

ISBN 978-615-5511-25-7

> *"Communicating in a mother tongue, Communicating in a foreign language, Mathematical, scientific and technological competence, Digital competence, Learning to learn, Social and civic competences, Sense of initiative and entrepreneurship, and Cultural awareness and expression."*

The working group (SWD, 2018) also presents the main challenges and difficulties of implementing these frameworks in schools, concluding that "translating key competences into learning outcomes is a major step to overcome difficulties in implementation". In addition, Halász and Michel (2011) state that

> *"there are significant differences between countries in their way of interpreting the notion of competence and of translating it according to their national contexts. [...] Countries differ not only in the strength of the commitment of key policy actors to the idea of competence-based education, but also in their capacities to implement complex curriculum reforms aimed at altering school level pedagogical approaches" (p.303).*

Competence assessment and the pedagogy of integration

In order to overcome these challenges, we developed a competence assessment methodology for the CRISS project that led us to explore how teachers can better understand the concept of CBE and how it should be implemented into the school curriculum.

Roegiers proposes the introduction of a competence approach in schools as a response to the shortcomings of the objective-based pedagogy with the idea of a "pedagogy of integration". The pedagogy of integration focuses on learning (mastering) competences, instead of acquiring isolated skills (Roegiers & Ketele, 2000). The goal of integration is to enable students to master situations that they will have to deal with in their lives.

As Boukhentache (2016) concludes, the main contribution of the pedagogy of integration is "its effort to structure learning through competencies by framing specific guidelines for implementation and evaluation of competencies through various syllabus specifications" (p.450).

In a thorough and systematic review of 21st century skills, Lai and Viering (2012) provided a set of recommendations for competence assessment, summarised in six recommendations to provide advanced solutions for the assessment of competences:

- Assessment systems should provide multiple measures that support the triangulation of inferences.
- Assessment tasks should be of sufficient complexity and/or offer sufficient challenge.
- Assessments should include open-ended tasks.
- Assessments should use tasks that establish meaningful and/or authentic, real-world problem contexts.

ISBN 978-615-5511-25-7

- Assessment tasks should strive to make student reasoning and thinking visible.
- Assessments should explore innovative approaches to address scalability concerns.

The CRISS project provides a way to integrate the complexity of DC and the necessary simplification and adaptation to implement it in schools. Furthermore, the Digital Competence Assessment System (DCAS) adopts and adapts the pedagogy of integration as a general approach, follows Pepper's (2013) principles and adopts Lai and Viering's (2012) recommendations for competence assessment. The foundations and methodology leading to the development of a theoretical construct and the basis for a system supporting digital competence assessment and certification are presented in Guàrdia, Maina, and Julià (2017).

The Digital Competence Assessment System (DCAS) was developed in coordination with the deployment of a Digital Competence Operational Concept (DCOC) (Guitert, Romeu, & Baztán, 2017), addressed to primary and secondary schools. The DCOC is the result of an analysis and mapping of seven European digital competence frameworks and schemes already in use with the DigCom. The DCOC consists of five areas (digital citizenship, digital communication and collaboration, searching and managing digital information, digital content creation, and digital problem solving) that group 12 sub-competences and corresponding performance criteria which translate the competences into more concrete elements of what students should be able to demonstrate. Each performance criterion (PC) is assessed according to a set of indicators. These indicators are observable characteristics of the PC.

The DCAS and the DCOC are integrated into teaching practice in the schools through a set of Competence Assessment Scenarios (CAS). Each CAS integrates one or more subjects or disciplines from the school curriculum. They are designed on the basis of advanced instructional approaches where the learner or learners are required to solve problems, develop projects or search for solutions in realistic contexts and meaningful situations.

In this paper, we present the development of a set of CAS covering the whole DCOC framework, built with the participation of primary and secondary teachers from different countries and disciplines, European policymakers and experts in digital competence.

Competence Assessment Scenarios (CAS

In order to ensure the validity, reliability and equity of the assessment process, CRISS proposes the creation of Competence Assessment Scenarios (CAS) where digital competences are developed and evaluated in context according to a set of rules described below.

The CRISS Digital Competence Assessment Strategy establishes each area, sub-competence and performance criterion considering their relevance to the school context. In this sense, CAS are integrated into the school curriculum. At the same time, integration activities are those which enable the assessment of different competences and subjects in a specific learning scenario.

ISBN 978-615-5511-25-7

A CAS develops within a temporally bounded situation where disciplinary or interdisciplinary knowledge or knowledge subjects and digital competences are integrated in line with the school curriculum. Furthermore, a CAS adopts advanced instructional approaches in which the learner or learners play the central role in solving problems, developing projects or searching for solutions in realistic contexts and meaningful situations. CAS instructional approaches are macrostrategies that "set a general direction or trajectory for the instruction and are comprised of more precise or detailed components" (Reigeluth & Keller, 2009; p.31).

A CAS proposes a set of activities and tasks that enable the assessment of one or more performance criteria. In addition, a set of rules for areas, sub-competences, performance criteria and indicators has been defined to ensure the validity, reliability and equity of competence assessment. The most important of these is the *rule of 2/3*, which gives the student three opportunities (events) to practice each performance criterion. It is considered that there is mastery of a PC when it is successful achieved on two out of three occasions.

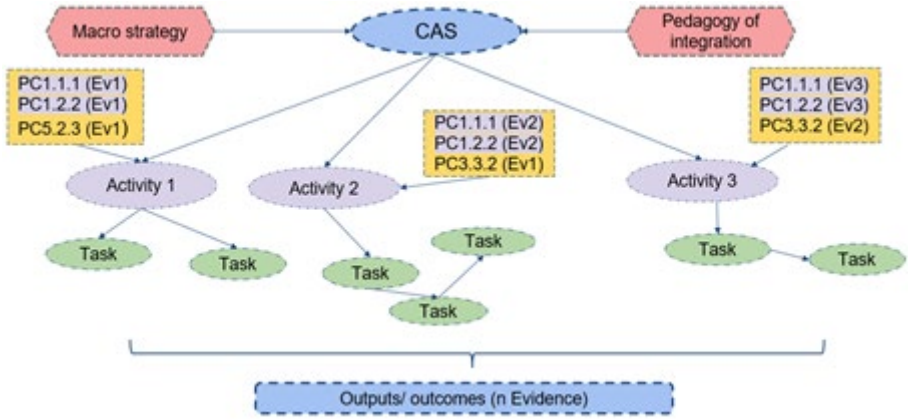


Figure 1. Principal elements of a Competence Assessment Scenario

In this example, the PC 1.1.1 (corresponding to Area 1 and sub-competence 1.1 is assessed three times (Ev1, Ev2 and Ev3) across the whole scenario. The same occurs with the PC 1.2.2 (corresponding to Area 1 and sub-competence 1.2).

CAS design and validation

For the CRISS project, a creation process for the scenarios produced by a group of teachers has been set up. A CAS may be created from scratch or built by adapting an existing learning project, didactic unit, lesson plan or learning activity. In any case, creating a CAS requires a continuous process of review and refinement.

The methodological process behind the CAS design can be summarised in three steps: a first round of CAS creation based on a guide, a focus group to analyse the work done and a second round of CAS creation.

A guide detailing the procedure for designing a CAS was created and issued to the teachers. The guide proposes a work process and provides a template with detailed information about

ISBN 978-615-5511-25-7

how a CAS should be structured, all the elements that a CAS should contain (see Figure 1) and specific examples.

In the first round, a set of scenarios was created, and this was followed by an internal validation carried out on the basis of two checklists: one to verify whether the information was complete and in line with the CRISS methodological approach, and another to check which elements of the operational concept (areas, sub-competences and performance criteria) were covered by the scenarios. The internal validation of a single CAS depends on the ability to integrate digital competence within a disciplinary or interdisciplinary approach; the use of methodological strategies that favour active learning; the clear specification of assessment strategies, methods and instruments to collect evidence for assessment; the proper description of the learning activities and tasks, and the inclusion of all the resources/information needed to carry out the tasks.

After the first round, a focus group was carried out to gather the CAS creators' opinions about the creation process and how to improve it. The participants were nine CAS creators: eight participants with more than ten years of teaching experience, and one with more than five years. All of them have experience of teaching with digital technologies and introducing competence-based learning activities into their classes, and all except one introduced competence-based assessment activities in their classes. During the two-hour session, the creation process was analysed and several improvements were suggested.

Before sharing their opinions, the participants completed a questionnaire on the same topics they were later invited to discuss.

The questionnaire was composed of seven questions: two regarding the creation process, one about how this process could change the design of assessment activities, and four more about the future implementation of the CRISS assessment approach in schools.

The most relevant conclusions concerning the CAS creation process that resulted from the focus group and the questionnaire analysis are:

- Participants tend to agree with the statement "The CRISS assessment approach helps me to design the CAS". (The average of an agreement scale from 1 to 4 was 3.6).
- CAS creation is easier when focused on a specific area from the DCOC framework, due to its extension.
- CAS creation is easier when based on the performance criteria.
- The CAS creation guide is rated as very useful. (The average of an agreement scale from 1 to 4 was 3.4). Some terms need to be clarified because of the different uses between countries.
- The creators find the template useful (The average of an agreement scale from 1 to 4 was 3.2), but too time-consuming due to the amount of detail it requests regarding the CAS.

ISBN 978-615-5511-25-7

Concrete suggestions for the second round of CAS design were shared with the creators (complete missing information, merge or fragment an activity, include additional PC in scenarios, improve the assessment instruments, etc.). The guide was also improved after the analysis conducted by the CAS creators.

In the second round, a second set of scenarios was created taking into account the suggestions provided and a second internal validation was carried out.

In the end, the methodological process followed ensures that:

- The CAS creation guide accomplishes the aim of helping creators to develop or adapt a CAS.
- Each CAS is complete and is in line with the CRISS methodological approach.
- The set of CAS covers all the elements of the Digital Competence Operational Concept.
- The set of CAS is in line with the Digital Competence Assessment System approach and requirements.

Next steps: pilots and external validation

The next step of the CRISS project is a pilot involving more than 490 schools, including 25,400 students and 2,290 teachers across Europe. The Digital Competence Assessment System, the Digital Competence Operational Concept as well as the content and applicability of the set of CAS will be tested during the pilot process.

To carry out the external validation, two principal strategies have been developed:

- a set of semi-structured interviews with CAS creators and users regarding their experience of implementing the proposal, and
- a questionnaire addressed to teachers and students based on the 10 criteria for Competence Assessment Programmes (Baartman et al., 2007). The questionnaire includes statements to evaluate these 10 criteria: Authenticity, Cognitive complexity, Fairness, Meaningfulness, Directness, Transparency, Educational consequences, Reproducibility of decisions, Comparability, and Costs and efficiency.

References

1. Baartman, L. K. J., Bastiaens, T. J., Kirschner, P. A., & van der Vleuten, C. P. M. (2007). Evaluating assessment quality in competence-based education: A qualitative comparison of two frameworks. *Educational Research Review, 2*(2), 114–129. https://doi.org/10.1016/j.edurev.2007.06.001
2. Biemans, H., Nieuwenhuis, L., Poell, R., Mulder, M., & Wesselink, R. (2004). Competence-based vet in the Netherlands: Background and pitfalls. *Journal of Vocational Education and Training, 56*(4), 523–538. https://doi.org/10.1080/13636820400200268

ISBN 978-615-5511-25-7

3. Boukhentache, S. (2016). Operationalization of Competency-Based Approach: From Competency-Based Education to Integration Pedagogy. *Arab World English Journal, 7*(4), 439.

4. Cedefop (Ed.) (2008). *Terminology of European education and training policy: a selection of 100 key terms.* Luxembourg: Office for Official Publications of the European Communities. Retrieved from http://www.cedefop.europa.eu/files/4064_en.pdf

5. Clements, M. D., & Cord, B. A. (2013). Assessment guiding learning: developing graduate qualities in an experiential learning programme. *Assessment & Evaluation in Higher Education, 38*(1), 114–124. https://doi.org/10.1080/02602938.2011.609314

6. EU (2006). *Recommendation of the European Parliament and of the Council of 18 December 2006 on key competences for lifelong learning.* Retrieved from http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32006H0962&from=EN

7. Ferrari, A. (2012). *Digital Competence in Practice: An Analysis of Frameworks* (Report EUR 25351). Institute for Prospective Technological Studies, European Commission.

8. Guàrdia, L., Crisp, G., & Alsina, I. (2016). Trends and challenges of e-assessment to enhance student learning in Higher Education. In E. Cano & G. Ion (Eds.), *Innovative Practices for Higher Education Assessment and Measurement* (chapter 3, section 1). IGI Global. doi: 10.4018/978-1-5225-0531-0

9. Guàrdia, L., Maina, M., & Julià, A. (2017). Digital Competence Assessment System: Supporting teachers with the CRISS platform. *Proceedings of 28th Central European Conference on Information and Intelligent Systems (CECIIS).* Varazdin (Croatia), September 27-29.

10. Guitert, M., Romeu, T., & Baztán, P. (2017). Conceptual framework on digital competences in primary and secondary schools in Europe. *Proceedings of the 10th Annual International Conference of Education, Research and Innovation.* Sevilla: IATED.

11. Halász, G., & Michel, A. (2011). Key Competences in Europe: interpretation, policy formulation and implementation. *European Journal of Education, 3*, 289. https://doi.org/10.1111/j.1465-3435.2011.01491.x

12. Lai, E. R., & Viering, M. (2012). *Assessing 21st Century Skills: Integrating Research Findings.* Vancouver: National Council on Measurement in Education. Retrieved from https://goo.gl/INDEG6z

13. Lassnigg, L. (2015). Competence-based education and educational effectiveness. A critical review of the research literature on outcome-oriented policy making in education. *IHS Sociological Series, 111.* Retrieved from https://www.ihs.ac.at/fileadmin/public/soziologie/rs111.pdf

14. Pepper, D. (2013). *KeyCoNet 2013 Literature Review: Assessment for key competences.* KeyCoNet. Retrieved from

ISBN 978-615-5511-25-7

http://keyconet.eun.org/c/document_library/get_file?uuid=b1475317-108c-4cf5-a650-dae772a7d943&groupId=11028

15. Reigeluth, C. M., & Keller, J. B. (2009). Understanding instruction. In Instructional-Design Theories and Models. In C. M. Reigeluth A. Carr-Chellman (Eds.), *Vol. III: Building a Common Knowledge Base* (pp.27-39). New York: Routledge.
16. Roegiers, X., & Ketele, J.-M. de. (2000). *Une pédagogie de l'intégration: compétences et intégration des acquis dans l'enseignement* (1re éd). Bruxelles: De Boeck Université.
17. SWD (2018). *Proposal for a COUNCIL RECOMMENDATION on Key Competences for LifeLong Learning.* Retrieved from https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=SWD:2018:0014:FIN

ISBN 978-615-5511-25-7

Towards Personalized Guidance and Support for Learning
Proceedings of the 10th European Distance and E-Learning Network Research Workshop, 2018
Barcelona, 24-26 October, 2018
ISBN 978-615-5511-25-7

MATURITY MODELS FOR IMPROVING THE QUALITY OF DIGITAL TEACHING

Felix Sanchez-Puchol, Universitat Oberta de Catalunya (UOC) & SEIDOR SBS Learning Services, Joan A. Pastor-Collado, Universitat Politècnica de Catalunya (UPC), Lourdes Guàrdia-Ortiz, Universitat Oberta de Catalunya (UOC), Spain

Summary

In this paper we present a primer on the state-of the-art of existing maturity models (MMs) for eLearning. By means of a traditional qualitative literature review, 29 different models are identified. Next, they are analysed and classified on the basis of a framework of 20 common properties derived from general theory on MMs, considering aspects related to their definition, structure and practical use. Results of the analysis suggest that existing eLearning MMs mainly address problems linked to eLearning management and organization at institutional level, educational technology, instructional design and faculty staff professional development. However, they tend to provide relatively moderate support for being effectively applied in practice, which clearly compromises and dismisses their power and utility as prescriptive tools for quality improvement. Our findings contribute to the current body of knowledge on eLearning by providing improved understanding, visibility, transparency and traceability of eLearning MMs designed to date, which may be of interest to both practitioners and researchers.

Introduction

Maturity models (MMs) are well-recognized instruments for systematically assessing and developing quality improvement actions for activities, processes, technologies, skills or any other object existing in an organization (Blondiau, Mettler, & Winter, 2016; Mettler, 2011; Reis, Mathias, & de Oliveira, 2017). Over the last years, a plethora of generic and domain-specific MMs have been designed covering a wide range of application areas, including education (Wendler, 2012; pp.1328–1329). However, progress in the conception of these artefacts tailored to concrete eLearning domains has been rather slower and limited compared with other fields. Hence, the topic of MMs for eLearning is still an insufficiently researched field, which may result in an undervaluation of such artefacts as tools for quality management and improvement in eLearning contexts.

To bridge such a gap, in this paper we review the status quo of existing MMs in eLearning. In so doing, we aim to contribute to the current body of knowledge by (a) raising awareness of their existence and potential practical relevance among the eLearning community, (b) providing a unified and homogeneous reference catalogue of eLearning MMs constructed to

date, (c) increasing the visibility, transparency and traceability of these instruments for the benefit of the different eLearning stakeholders. The innovative aspect of the paper is grounded on the fact that, to the best of our knowledge, no previous attempt has been undertaken to investigate the state of affairs of existing eLearning MMs in depth. Although similar studies have been conducted to compare or critically review eLearning quality assurance models, benchmarking tools or performance assessment methods (Coralesce, 2014; Marciniak, 2018; Marshall & Sankey, 2017; Ossiannilsson, Williams, Camilleri, & Brown, 2015; Scepanovic, Devedzic, & Kraljevski, 2011) none of them has been exclusively focussed on MM artefacts.

The content and findings presented in this paper may be of interest to both practitioners and researchers. The former will find a simple and light-weight decision-making tool to easily find and select available MMs which may help them assess and define improvement actions for their eLearning initiatives quickly and economically. Academics can also take advantage of the panoramic view of the eLearning MMs presented in the paper to identify potential weaknesses and drawbacks of the designed models and uncover future research opportunities for building new models targeted at the as yet unexplored sub-domains of eLearning prompted by the study.

Background

MMs are artefacts that represent "phases of increasing quantitative or qualitative capability changes of a maturing element in order to assess its advances with respect to defined focus areas" (Kohlegger, Maier, & Thalmann, 2009; p.59). They are conceptual models showing anticipated, desired, or typical evolution paths of a concrete class of objects, shaped as discrete stages of maturity (Becker, Knackstedt, & Pöppelbuss, 2009; p.213). From a structural point of view, MMs typically consist of two main components (Mettler, 2011; Ofner, Otto, & Österle, 2015; Tarhan, Turetken, & Reijers, 2016): a (reference) domain model, providing one or multiple criteria by which the addressed domain can be partitioned into discrete units to be assessed (what needs to be measured); and an assessment method/model, which takes an inquiring view to evaluate and obtain a mark of the current status (maturity) level achieved by the evaluated item against the reference domain model (how it can be measured).

Depending on their potential usefulness, MMs can be classified as (de Bruin, Freeze, Kaulkarni, & Rosemann, 2005; Pöppelbuss & Röglinger, 2011): (a) *descriptive,* allowing the current (as-is) state of maturity of a targeted domain or object to be assessed, (b) *prescriptive*, enabling the definition of concrete roadmaps for improvement towards a desired (to-be) state, as well as checking their effectiveness; or (c) *comparative,* providing support for conducting internal or external comparative benchmarking. Hence, MMs transcend benchmarking tools as it is possible to adapt them to particular contexts; thus becoming suitable tools for providing practical guidance to develop roadmaps or plans for quality improvement, digital transformation initiatives or facilitating organizational adoption of new technologies. Probably, the most paradigmatic example of MMs is the Capability Maturity Model (CMM), introduced in the early 1990s by the Carnegie Mellon Software Engineering Institute (Paulk, Curtis, Chrissis, & Weber, 1993). CMM is based on a relatively complex and elaborate formal

ISBN 978-615-5511-25-7

architecture, specifying a number of goals and key practices to reach a predefined level of maturity (Mettler, 2009; p.377; Paulk et al., 1993). CMM-like MMs are often taken as a reference point for designing new MMs, as, for example, in the case of the well-known eLearning Maturity Model (Marshall, 2010; p.146).

Research approach

To investigate existing eLearning MMs we first conducted an extensive qualitative literature review following general and well-accepted guidelines for undertaking such reviews (Hart, 1998). We searched for potentially relevant information sources made available through digital libraries such as Web of Science, Scopus, Springer Link, Emerald or IEEE Xplore. We also used the general Google web search tool to expand the scope and coverage of our search to non-peer-reviewed sources. Inspired by previous studies, the search strategy was set to find combinations of words and expressions such as "eLearning", "mLearning", "distance education", "online education", "online learning", "virtual learning", "virtual education", "blended learning", "blended education", "web based education" and "open education" with others such as "maturity model", "maturity matrix", "maturity assessment", "maturity instrument", "maturity grid" and "capability maturity" in the title, keywords or abstract of the source. Due to the limited search features offered by some platforms, minor adjustments had to be made in some cases to the specific final searches executed. No temporal or language restriction was explicitly considered. The searches were executed iteratively between February and May 2018, in order to incrementally identify and accumulate newly emerged potentially relevant information sources.

After a perusal analysis of the sources yielded by the previous search, we excluded those related with MMs but targeted at application domains not focussed on eLearning issues. We also excluded some tools such as Pick&Mix and Towards Maturity, as they have traditionally been considered as benchmarking instruments. During this stage we also learned of the existence of a Blended Learning MM (EMBED Project Consortium, 2017) or an MM for E-Learning Classroom, Bimodal & Virtual Courses in HE (Espinoza-Guzmán & Zermeño, 2017). However, we had to exclude them for subsequent analysis as, at the moment of writing the paper, they were still ongoing projects for which insufficient evidence on the structure and content of the MM were found. To conclude with the search process, a snowballing approach was used to track the citations of the sources containing core knowledge of the identified eLearning MMs backward and forward. We did so in order to either uncover additional MMs or to obtain complementary information on existing ones for subsequent analysis. Scopus was used as a support tool for forward tracking purposes. We proceeded iteratively in this way until a saturation point was reached (Boell & Cecez-Kecmanovic, 2014; Webster & Watson, 2002).

To organize and classify our findings we adopted a concept-oriented approach (Webster & Watson, 2002) to define an analysis framework. We relied on existing MM theory, and more concretely, on proposals of taxonomies and design principles for characterizing generic MMs (de Bruin et al., 2005; Mettler, 2010; 2011; Pöppelbuss & Röglinger, 2011), which were slightly

ISBN 978-615-5511-25-7

adapted for our purposes in this study. Grounding the information inductively obtained from the available documentary sources, we finally decided to investigate a set of 20 different properties for each uncovered MM. For the sake of comprehensiveness, selected properties were grouped into three major blocks of similar characteristics, namely, (a) definition properties, considering basic identifying descriptive attributes of the MMs; (b) design properties, describing the form and organization of the MMs and (c) use properties, considering issues related to deployment and practical application of the MMs. In so doing, we set the MMs as a basic unit for analysis. Due to space restrictions, the concrete properties investigated are described in detail in the additional supplementary material complementing this paper (supplementary material can be accessed at: https://goo.gl/7M98Mv).

Results and discussion

A total set of 29 eLearning MMs were identified grounded on the knowledge that emerged from the information sources collected in the review process. Diversity in the format types of the sources containing relevant information on the MMs (conference and journal articles, book chapters, wikis/web pages, working papers and reports, etc.) suggests that eLearning researchers and practitioners draw on a wide variety of heterogeneous communication mechanisms to disseminate their proposed artefacts. Collectively, it can be concluded that previous work on eLearning MMs has been rather scattered and disperse. Also, we believe that the number of MMs identified in the study is quite significant, as previously referred to studies (see introductory section) tend to compare or analyse cohorts of 8-12 artefacts. If we look at the temporal data for the bibliographic references used in the analysis, it seems that over two-thirds of the eLearning MMs discussed have been constructed between 2011 and 2018. This fact can be interpreted as a clear sign of the eLearning community's increasing interest in MMs over the last years. An in-depth analysis and classification of the identified eLearning MMs is presented in the following Tables 1 and 2. In the remainder of the section, we discuss the results of the analysis from the aggregate perspective of the three main blocks of properties considered in the previous section.

Definition properties

Our analysis reveals a certain balance regarding the origin of existing eLearning MMs. Hence, it is plausible that they may have been conceived either through academic or from professional initiatives. We also appreciate that developers of existing models tend to omit the target audience they are intended for. Thus, although it was sometimes possible for us to infer the intended audience of the evaluated MM through an in-depth content analysis of the available information sources, future developments should pay special attention to clearly and explicitly stating the audience of the created MM. In terms of accessibility, all the investigated MMs are freely available. In Figure 1, we depict the targeted application scope of the uncovered eLearning MMs based on the taxonomy of research streams proposed by Zawacki-Richter and Anderson (2014). The graphic shows that the main topics addressed by existing models include institutional management and organization of eLearning initiatives, instructional design, educational technologies and teaching staff support and development.

ISBN 978-615-5511-25-7

Furthermore, it can be clearly noted that there is room for building new MMs in many as yet unaddressed eLearning sub-domains, especially at the macro level (i.e. distance education systems and theories).

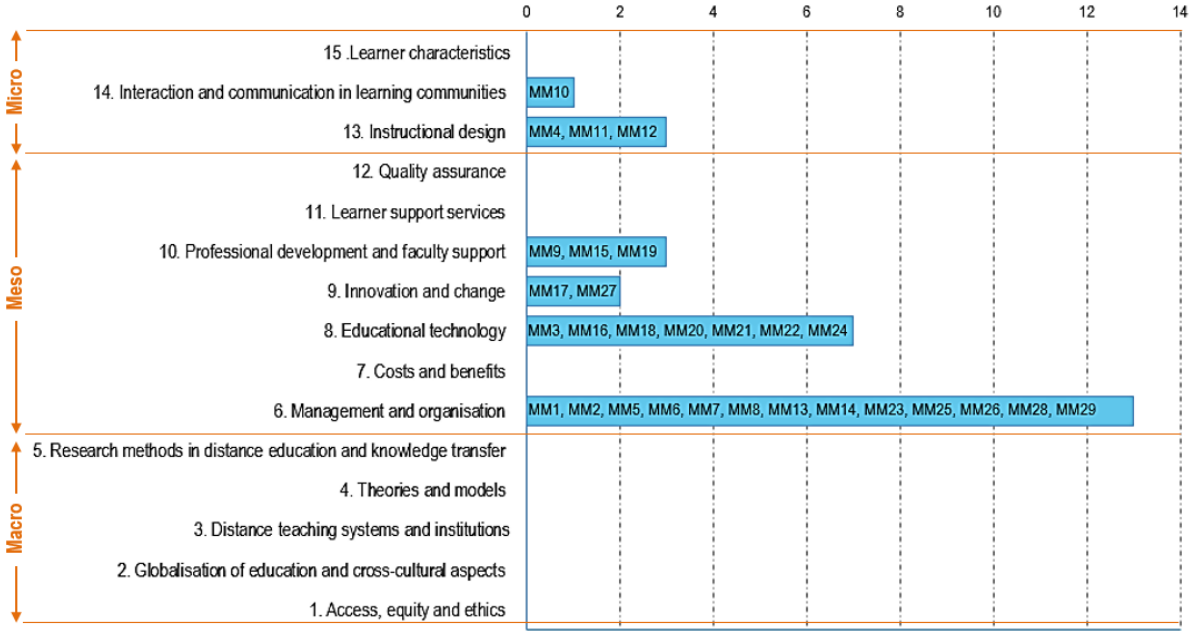


Figure 1. Application scope of the investigated MMs, based on the taxonomy by Zawacki-Richter and Anderson (2014)

ISBN 978-615-5511-25-7

Table 1: Analysis and classification of the uncovered eLearning MMs: definition properties

MM	DEFINITION ATTRIBUTES Name	Abbreviation	Base References	Scope	Origin		Target audience						Access.	
				Code	Academia	Practitioners	Both (mix)	Management	Teaching staff	Technical staff	Students	Unclear	Free	Charged
1	e-Learning Maturity Model	eMM	(Marshall, 2010; Marshall & Mitchell, 2002)	[6]	■			■					■	
2	META Group E-Learning Maturity Model	—	(Vollmer, 2003)	[6]		■		■					■	
3	Taxonomy for levels of maturation to full implementation of web portfolios	—	(Love, Mckean, & Gathercoal, 2004)	[8]		■		■	■	■	■		■	
4	Online Course Design Maturity Model	OCDMM	(Neuhauser, 2004)	[13]	■				■				■	
5	e-Learning Capability Maturity Model	ECM2	(Manford, McSporran, Mann, & Williamson, 2003)	[6]	■							■	■	
6	The Four stages of eLearning	—	(Bersin, 2005; Mallon & Clarey, 2011)	[6]		■		■					■	
7	Distance Education Capability Maturity Model	education-CMM	(Hill, Kile, Little, & Shah, 2005)	[6]	■							■	■	
8	ACL e-Learning Positioning Statement	ACL/eLPS	(Coralesce, 2014; Luger, 2007; Researching Virtual Initiatives in Education, n.d.)	[6]		■		■					■	
9	On line Teaching Staff Maturity Model	OTMM	(Soliman, 2008)	[10]	■				■				■	
10	Framework for Evaluation of Virtual Learning Communities	—	(Athanasiou, Maris, & Apostolakis, 2009)	[14]	■							■	■	
11	Content Maturity Model for the EHEA eLearning Process	CMM_EHEA	(Cocón, 2011; Cocón & Fernández, 2011)	[13]	■				■				■	
12	Online Course Quality Maturity Model	OCQMM	(Gu, Chen, & Pu, 2011)	[13]	■							■	■	
13	Open Educational Practice Maturity Matrix	—	(Open Educational Quality Initiative, 2011)	[6]			■	■					■	
14	E-learning Process Capability Maturity Model	ePCMM	(Zhou, 2012)	[6]	■							■	■	
15	Open Educational Resources (Reuse) Engagement Ladder	—	(Masterman & Wild, 2013; Wild, 2012)	[10]	■				■				■	
16	Mobile Learning Maturity Model	MLMM	(Alrasheedi, 2015; Alrasheedi & Capretz, 2013)	[8]	■			■			■		■	
17	Maturity Model for Teacher's Digital Content Sharing	—	(Kaewkiriya, Saga, & Tsuji, 2013)	[9]		■			■				■	
18	ePortfolios & Open Badges Maturity Matrix Framework	ePOBMM	(European Network of ePortfolio Experts & Practitioners, 2013)	[8]			■					■	■	
19	Continuum for Open Educational Resources adoption in a HE context	—	(Stagg, 2014)	[10]	■				■				■	
20	High-Performance Mobile Learning Maturity Model	—	(Net Dimensions, 2014; Wentworth, 2014)	[8]		■		■					■	
21	ePortfolio Maturity Model	—	(Rubens & Kemps, 2007)	[8]		■						■	■	
22	Quality Model for Educational Products Based on ICT	eQETIC	(Rossi, 2013; Rossi & Mustaro, 2015)	[8]	■				■	■	■		■	
23	E-research Infrastructure Service Provision Maturity Model	HWMD	(Holewa, Wolski, Dallest, & McAvaney, 2015)	[6]			■	■		■			■	
24	Virtual Learning System Usability Maturity Assessment Framework	VLS-UMAF	(Omieno & Rodriguez, 2015, 2016)	[8]	■				■		■		■	
25	Lively Digital Learning Maturity Model	—	(Edmonds, 2016)	[6]		■						■	■	
26	e-Learning Capability Maturity Model	ELCMM	(Hammad, Odeh, & Khan, 2017)	[6]	■							■	■	
27	Future Classroom (Innovation) Maturity Model	—	(European Schoolnet, n.d.; Van Assche, Anido, Griffiths, Lewin, & McNicol, 2015)	[9]		■		■	■	■			■	
28	The eLearning Roadmap	—	(Professional Development Service for Teachers Technology in Education, n.d.)	[6]		■						■	■	
29	Framework for Digitally Mature Schools (eSchools)	FDMS	(Balaban et alt.,2018; Begičević Ređep et alt., 2017; CARNET - Project e-Schools, 2018; Jugo et alt., 2017)	[6]			■	■					■	
	—	—	—	—	15	10	4	11	10	4	4	10	29	0

ISBN 978-615-5511-25-7

Table 2: Analysis and classification of the uncovered eLearning MMs: design and use properties

MM	DESIGN ATTRIBUTES: Maturity concept				Dimensions / attributes	Maturity levels			Architectural composition				Path to maturation			Reliability			Muta-bility	USE ATTRIBUTES: Method of application			Support of application			Practicability of evidence			Dissemi-nation	
	Process	People	Object	Unclear	Number	Number	Descriptor	Description	Textual grid	Likert-like quest.	CMM-like	Others / unclear	Staged	Continuous	Both	Tested	Verified	Unclear	Released (updated)	No supporting materials	Textual descrip. or handbook	Software assessment tool	Self-assessment	Third-party assessment	Certified practitioners	Implicit improvements	Specific recom-mendations	Unclear	Open	Restricted
1	■				5/35	5	Yes	Yes			■			■		■	■		Yes			■	■			■			■	
2	■				3x5	5	Yes	No	■					■				■	No	■			■			■			■	■
3			■		14x5	5	Yes	Yes	■				■			■		■	No	■			■			■			■	
4	■				5/68	5	Yes	Yes			■			■			■		No	■			■			■			■	
5	■	■	■		3/39	5	Yes	Yes			■			■		■			No	■			■			■			■	
6				■	12	5	Yes	Yes				■	■					■	Yes		■		■			■			■	
7	■				11/46	5	Yes	Yes			■				■			■	No	■			■					■	■	
8	■	■	■		5/31	5	Yes	No		■				■		■			Yes			■	■			■			■	
9	■				5/53	5	Yes	Yes			■			■			■		No	■			■			■			■	
10			■		4/18	5	Yes	No		■				■				■	No	■			■					■	■	
11			■		2/9	5	Yes	Yes			■		■			■			No	■			■				■		■	
12	■			■	6/18	4	Yes	Yes			■		■			■			No	■			■			■			■	
13	■	■	■		(3)/17x5	5	Yes	No	■					■				■	No	■			■			■			■	
14	■				5/--	6	Yes	Yes			■				■			■	No	■			■			■			■	
15		■			14	4	Yes	Yes				■	■				■		No	■			■				■		■	
16	■				1/18	5	Yes	Yes			■		■			■	■		No	■			■			■			■	
17				■	8/--	4	Yes	Yes				■	■					■	No	■			■					■	■	
18	■	■	■		(8)/60x5	5	Yes	Yes	■					■				■	Yes			■	■			■			■	
19		■			1x5	5	Yes	Yes	■				■					■	No	■			■			■			■	
20			■		6/24	4	Yes	No				■		■				■	No	■			■			■			■	
21			■		5x5	5	Yes	Yes		■				■		■			No	■			■					■	■	
22			■		6/50-89	3	Yes	Yes				■	■					■	No			■	■			■				■
23	■	■	■		6/43	5	Yes	No		■				■		■			No			■	■			■				■
24			■		4/10	5	Yes	Yes		■				■			■		No			■	■					■		■
25			■		5/20	5	No	No				■		■				■	No	■			■					■	■	
26	■				4/26	5	Yes	No			■			■				■	No	■			■			■			■	
27	■	■	■		5x5	5	Yes	Yes	■					■		■			No		■		■			■			■	
28	■	■	■		(5)/27x4	4	Yes	No	■					■		■			No		■		■			■			■	
29	■	■	■		(5)/38x5	5	Yes	Yes	■					■		■	■		No			■	■			■				■
Σ	17	10	16	3	[2/4 – 11/14]	[3-6]	29	20	8	5	10	6	9	18	2	12	7	14	4	19	3	7	29	0	0	21	2	6	24	5

Design properties

The analysis of the design properties of the uncovered MMs shows a great level of heterogeneity in terms of the maturity concept considered. On the one hand, MMs based on a unidimensional maturity conceptualization (18 of the 29 models investigated) principally encompass either a process-oriented or an object- (i.e. technology-) oriented conceptualization of maturity (eight instances for each case). On the other hand, another eight MMs use a rather multidimensional conceptualization of maturity, combining people-, process- and object-centric factors. Much more heterogeneity can be observed regarding the number of dimensions defined by the MMs to configure the maturity assessment, which tends to vary from 2/4 to 11/14 dimensions. In a similar vein, 75.8% of the investigated MMs define five maturity levels. These results are in line with common design parameters characterizing MMs targeted at other application domains than eLearning. 20 of the 29 investigated MMs incorporate a description of the intent of each one of the maturity levels considered, which can be interpreted as a positive sign in terms of clarity and understandability. Finally, and regarding the path to maturation (i.e. principle of maturity) of MMs, our analysis shows a clear imbalance in favour of continuous-oriented MMs versus staged ones (18 vs. 9), with two MMs (education-CMM and ePCMM) simultaneously supporting both configurations.

Concerns about the completeness and rigour of the existing eLearning MMs also arose. On the one hand, the composition of six of the 29 investigated MMs remains unclear to us. This is especially significant for MMs originated from practice, which tend to be poorly documented, and therefore, their composition is sometimes roughly described. On the other hand, and although it is true that 10 of the 29 MMs studied present a CMM-like architectural composition – representing the more formal possible architectural design for a MM –, in many cases they are conceived as either mere derivations or adaptations of existing CMM-like MMs. As derivation is generally done though a rudimentary or informal methodological process, the resulting MMs tend to present a quite simple, incomplete or extremely abstract CMM-like structure. Besides, they also lack (in many cases) a strong theoretical foundation justifying their structural dimensions. Finally, 27.6% of the investigated MMs are just textual maturity grids, which represent the simplest possible architectural structure for a MM. All in all, and under such circumstances, it was not surprising for us to find a high number of MMs (14 of 29) with unclear reliability. Exceptions to this rationale could be the Framework for Digitally Mature eSchools and especially Marshall's eLearning MM. We found multiple evidence testing and applying the latter MM in many different educational contexts. We interpret this finding as a clear symptom that the model has achieved a certain position of 'de-facto' standard in the worldwide eLearning community. This seems to be confirmed in terms of mutability, as it is also one the few MMs that has been released over time, adapting the original defined model's configuration to the new requirements, practices and technologies that have progressively emerged in the eLearning discipline.

ISBN 978-615-5511-25-7

Use properties

Lastly, the analysis of the use properties of the identified eLearning MMs revealed to us that they only provide a moderate level of support for being applied in practice. We must highlight at this point that a great number of the information sources reviewed were exclusively concerned with the description and design of the MMs, but mostly omitted to consider how to apply them (i.e., if they incorporate or include a formal assessment method, how to collect data for assessment, etc.). Hence, it was sometimes quite complicated for us to discover the concrete method of application of the MMs. Therefore, when no information on this matter was provided by the sources, we considered that the MM does not formally provide supporting materials for its application (19 of the investigated MMs). Conversely, we found much more clarity in the fact that the models constructed are primarily intended for self-assessment purposes. However, it must be noted that the lack of formality in defining a clear MM method of application or assessment may lead to inaccurate (maturity) measurements, which in turn, will clearly dismiss and compromise the intended objective of the model as well as its utility for quality improvement.

Another important attribute regarding the operative application of an MM is the practicability of the evidence (i.e., the way suggestions for improvement are made) provided by the artefact. In general, the eLearning MMs investigated tend to provide implicit suggestions and recommendations rather than explicit recommendations for improvement telling users what to do to enhance a particular element or capability (74.2 % of the reviewed MMs). This is typically the case of textual maturity grids, from which implicit improvement actions can be inferred from the descriptions contained in each cell of the matrix. This finding is consistent with the situation that can be found for MMs designed to assess maturity in any other targeted field or domain. In general, establishing explicit improvement recommendations for complex domains or objects of analysis is very complicated, and therefore, explicit recommendations are plausible (and useful) only when relatively concrete objects or delimited domains are being addressed. In terms of our reviewed eLearning MMs, this is the case, for example, when designing an online course (CMM_EHEA model) or when reviewing people's engagement in terms of Open Educational Resources (OER) reuse practices (OER Engagement Ladder). To conclude, we found five MMs with some kind of access restriction in terms of availability of either the whole content of the model or (especially) the support tool incorporated for conducting the practical assessment.

Conclusion

In this paper, a set of 29 eLearning MMs are investigated and classified by means of a conceptual framework of 20 attributes, considering definitional, structural and applicability issues of the models. Key findings of the analysis show that eLearning MMs (a) have been originated from both academia and practice; (b) mainly address problems concerned with eLearning institutional organization and management, educational technology, instructional design or staff professional development; (c) present a heterogeneous and rather simple structural configuration; and (d) provide moderate support for being applied in practice. Our

ISBN 978-615-5511-25-7

analysis suggests that MMs are valuable tools to identify potential areas of improvement in digital teaching and learning activities. Furthermore, they could also act as practical assistance tools to provide guidance on how to progressively enable the adequate conditions for more personalized learning and student support in digital environments. In this sense, we envision tremendous avenues for further research in the development of new and more operative MMs for eLearning domains yet unaddressed by existing ones. Finally, the main limitation of the study lies in the possible subjectivity introduced by the authors' appreciations when considering each one of the properties analysed.

References

1. Alrasheedi, M. (2015). *A maturity model for mobile learning* (Doctoral dissertation). Western University, London, Ontario, Canada. Retrieved from https://ir.lib.uwo.ca/cgi/viewcontent.cgi?article=4422&context=etd
2. Alrasheedi, M., & Capretz, L. F. (2013). *An m-learning maturity model for the educational sector.* Paper presented at the 6th Conference of MIT Learning International Networks Consortium, Cambridge, Massachusetts. Retrieved from http://ir.lib.uwo.ca/electricalpub/17
3. van Assche, F., Anido, L., Griffiths, D., Lewin, C., & Mc Nicol, S. (Eds.). (2015). *Re-engineering the uptake of ICT in Schools.* Springer International Publishing. doi:10.1007/978-3-319-19366-3
4. Athanasiou, G., Maris, N., & Apostolakis, I. (2009). Evaluation of virtual learning communities for supporting e-learning in the healthcare domain. *The Journal on Information Technology in Healthcare, 7*(3), 187–192.
5. Balaban, I., Begičević Ređep, N., & Klacmer Calopa, M. (2018). The analysis of digital maturity of schools in Croatia. *International Journal of Emerging Technologies in Learning, 13*(6), 4–15. doi:10.3991/ijet.v13i06.7844
6. Becker, J., Knackstedt, R., & Pöppelbuss, J. (2009). Developing maturity models for IT management. *Business & Information Systems Engineering, 1*(3), 213–222. doi:10.1007/s12599-009-0044-5
7. Begičević Ređep, N., Balaban, I., Žugec, B., Klačmer Čalopa, M., & Divjak, B. (2017). Framework for digitally mature schools. In A. Volungeviciene & A. Szűcs (Eds.), *Distance and E-Learning Network European Distance and E-Learning Network, EDEN 2017. Annual Conference* (pp. 360–371). 13-16 June, Jönköping, Sweden.
8. Bersin, J. (2005). *The four stages of e-learning. A maturity model for online corporate training.* Bersin & Associates. Retrieved from https://immagic.com/eLibrary/ARCHIVES/GENERAL//BERSINUS/B051002B.pdf
9. Blondiau, A., Mettler, T., & Winter, R. (2016). Designing and implementing maturity models in hospitals: An experience report from 5 years of research. *Health Informatics Journal, 22*(3), 758–767. doi:10.1177/1460458215590249

ISBN 978-615-5511-25-7

10. Boell, S. K., & Cecez-Kecmanovic, D. (2014). A hermeneutic approach for conducting literature reviews and literature searches. *Communications of the Association for Information Systems, 34*(1), 257–286.

11. De Bruin, T., Freeze, R., Kaulkarni, U., & Rosemann, M. (2005). Understanding the main phases of developing a maturity assessment model. In B. Campbell, J. Underwood, & D. Bunker (Eds.), *Australasian Conference on Information Systems (ACIS)* (pp. 8–19). Sydney, Australia. Retrieved from https://eprints.qut.edu.au/25152/

12. CARNET - Project e-Schools. (2018). e-Schools [Web Portal]. Retrieved June 1, 2018, from https://www.e-skole.hr/en/results/digital-maturity-of-schools/

13. Cocón, F. (2011). *Marco para el soporte de la interoperabilidad en almacenes de objetos de aprendizaje en la docencia e_learning universitaria adaptada al EEES* [In Spanish] (Doctoral dissertation). Escuela Técnica Superior de Ingeniería Informática. Departamento de Lenguajes y Sistemas Informáticos I, Alcalá de Henares, Madrid, Spain. Retrieved from https://eciencia.urjc.es/handle/10115/11348

14. Cocón, F., & Fernández, E. (2011). *MMCbEEES: Maturity model in the e-Learning teaching environment adapted to the EHEA.* Paper presented at the 6th Iberian Conference on Information Systems and Technologies, Chaves, Portugal. Retrieved from http://ieeexplore.ieee.org/document/5974198

15. Coralesce (2014). *Review of learning technology self-assessment.* Baseline Report July 2014. Coralesce Ltd. Retrieved from http://www.edtech-assess.com/wp-content/uploads/2014/07/Bound-ETF-Learning-Technology-Self -Assessment-Baseline-Report-proofed-5th-August.pdf

16. Edmonds, S. (2016). Digital learning goodness [Web Page]. Retrieved June 1, 2018, from http://www.livelyco. co/digital-learning-goodness/

17. EMBED Project Consortium (2017). About EMBED. European maturity model for blended education (EMBED 2017-2020) [Web Page]. Retrieved from https://embed.eadtu.eu/about

18. Espinoza-Guzmán, J., & Zermeño, M. G. G. (2017). Maturity model for e-learning classroom, bimodal and virtual courses in higher education: A preliminary study. *International Journal of Web-Based Learning and Teaching Technologies, 12*(1), 19–31. doi: 10.4018/IJWLTT.2017010102

19. European Network of ePortfolio Experts & Practitioners (2013). eportfolios & open badges maturity matrix [Web page]. Retrieved May 30, 2018, from http://www.eportfolio.eu/matrix

20. European Schoolnet (n.d.). Tool 2.2 - A reference guide to the future classroom model [Web Portal]. Retrieved June 10, 2018, from http://fcl.eun.org/hr/toolset2

21. Gu, D., Chen, J., & Pu, W. (2011). Online course quality maturity model based on evening university and correspondence education (OCQMM). *Proceedings of the 2011 IEEE 3rd*

ISBN 978-615-5511-25-7

International Conference on Communication Software and Networks (ICCSN), 5–9. Xi'an, China. doi: 10.1109/ICCSN.2011.6013763

22. Hammad, R., Odeh, M., & Khan, Z. (2017). ELCMM: An e-learning capability maturity model. In P. Kommers & P. Isaías (Eds.), *Proceedings of the 15th International Conference (e-Society 2017)* (pp. 169–178). IADIS Press. Retrieved from http://www.iadisportal.org/digital-library/elcmm-an-e-learning-capability-maturity-model
23. Hart, C. (1998). *Doing a literature review: releasing the social science research imagination.* SAGE Ltd.
24. Hill, J., Kile, J. F., Little, D., & Shah, S. (2005). *A proposal for a distance education capability maturity model* (Education-CMM). School of Computer Science and Information Systems, Pace University. Retrieved from http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.561.4317&rep=rep1&type=pdf
25. Holewa, H., Wolski, M., Dallest, K., & McAvaney, C. (2015). The HWMD maturity model: A foundational framework to measure effectiveness of institutional research e-infrastructures. *Proceedings of the 2015 Higher Education Technology Agenda Conference (TETHA 2015),* 1–17. Gold Coast, Australia. Retrieved from http://dro.deakin.edu.au/view/DU:30073806
26. Jugo, G., Balaban, I., Pezelj, M., & Begicevic Redjep, N. (2017). Development of a model to assess the digitally mature schools in Croatia. In A. Tatnall & M. Webb (Eds.), *Tomorrow's Learning: Involving Everyone. Learning with and about Technologies and Computing* (pp. 169–178). Springer International Publishing. doi:10.1007/978-3-319-74310-3_19
27. Kaewkiriya, T., Saga, R., & Tsuji, H. (2013). Transparent digital contents sharing for science teachers. In S. Yamamoto (Ed.), *Human Interface and the Management of Information. Information and Interaction for Learning, Culture, Collaboration and Business* (pp. 53–62). Springer Berlin Heidelberg. doi:10.1007/978-3-642-39226-9_7
28. Kohlegger, M., Maier, R., & Thalmann, S. (2009). Understanding maturity models. Results of a structured content analysis. *Proceedings of I-KNOW '09 and I-SEMANTICS '09,* 51–61. Graz, Austria. Retrieved from http://iwi.uibk.ac.at/download/downloads/Publikationen/KMM.pdf
29. Love, D., Mckean, G., & Gathercoal, P. (2004). Portfolios to webfolios and beyond: Levels of Maturation. *EDUCAUSE Quarterly, 2004*(2), 24–37.
30. Luger, J. (2007). *Supporting the journey towards e-maturity. Key lessons and transferable practice emerging from the NIACE. E-Shift Transformation Projects.* National Institute for Adult and Continuing Education (NIACE). Retrieved from https://api.excellencegateway.org.uk/resource/import-msword:16813
31. Mallon, D., & Clarey, J. (2011). *The next generation of e-learning: A primer.* Bersin & Associates. Retrieved from https://hrotodayforum.com/emea/wp-content/uploads/2011/11/Next-Generation-Enterprise-Learning.pdf

ISBN 978-615-5511-25-7

32. Manford, C., McSporran, M., Mann, S., & Williamson, A. (2003). e-learning quality: becoming a level five learning organization. *Proceedings of the 6th Annual National Advisory Committee on Computing Qualification (NACCQ*), 343–348. July, 2003. Palmerston North, New Zeeland. Retrieved from http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.60.7173&rep=rep1&type=pdf

33. Marciniak, R. (2018). Quality assurance for online higher education programmes: design and validation of an integrative assessment model applicable to Spanish universities. *The International Review of Research in Open and Distributed Learning, 19*(2). doi:10.19173/irrodl.v19i2.3443

34. Marshall, S. (2010). A quality framework for continuous improvement of e-Learning: The e-Learning Maturity Model. *Journal of Distance Education, 24*(1), 143–166.

35. Marshall, S., & Mitchell, G. (2002). An e-learning maturity model? *Proceedings of the 19th Annual Conference of the Australian Society for Computers in Learning in Tertiary Education (ASCILITE), Auckland, New Zealand*, 1–10. Retrieved from http://www.ascilite.org/conferences/auckland02/proceedings/papers/173.pdf

36. Marshall, S., & Sankey, M. (2017). *The ACODE benchmarks for technology enhanced learning* (pp. 1–13). Paper Presented at the 2017 Higher Education Technology Agenda Conference (TETHA 2017), Auckland, New Zealand. Retrieved from http://handle.westernsydney.edu.au:8081/1959.7/uws:43376

37. Masterman, L., & Wild, J. (2013). Reflections on the evolving landscape of OER use. *OER* 13, 26 - 27 March 2013, Nottingham, UK.

38. Mettler, T. (2009). *A design science research perspective on maturity models in Information Systems.* Institute of Information Management, Universtiy of St. Gallen. Retrieved from https://www.alexandria.unisg.ch/214531/

39. Mettler, T. (2010). Thinking in terms of design decisions when developing maturity models. *International Journal of Strategic Decision Sciences, 1*(4), 76–87. doi:10.4018/jsds.2010100105

40. Mettler, T. (2011). Maturity assessment models: a design science research approach. *International Journal of Society Systems Science, 3*(1–2), 81–98. doi:10.1504/IJSSS.2011.038934

41. Net Dimensions (2014). A Framework for Mobile Learning. Net Dimensions -Brandon Hall Group, Inc. Retrieved from http://www.netdimensions.com/assets/videos/webinars-on-demand/slide-framework-mobilelear ning.pdf

42. Neuhauser, C. (2004). A maturity model: does it provide a path for online course design. *The Journal of Interactive Online Learning, 3*(1), 1–17.

43. Ofner, M., Otto, B., & Österle, H. (2015). A maturity model for enterprise data quality management. *Enterprise Modelling and Information Systems Architectures, 8*(2), 4–24.

ISBN 978-615-5511-25-7

44. Omieno, K. K., & Rodriguez, A. (2015). Performance-based usability maturity assessment framework for VLS in universities. *International Journal of Advanced Research in Computer and Communication Engineering, 4*(12), 6–14. doi:10.17148/IJARCCE.2015.41202

45. Omieno, K. K., & Rodriguez, A. (2016). Usability maturity model and assessment tool for virtual learning systems. *International Journal of Advanced Research in Computer and Communication Engineering, 5*(12), 86–95. doi:10.17148/IJARCCE.2016.51217

46. Open Educational Quality Initiative (2011). Guidelines for open educational practices in organizations (Vs. 2011). Open Educational Quality Initiative (OPAL), 2011. Retrieved from http://oerworkshop.pbworks.com/w/file/fetch/ 44605120/OPAL-OEP-guidelines.pdf

47. Ossiannilsson, E., Williams, K., Camilleri, A. F., & Brown, M. (2015). Quality models in online and open education around the globe. State of the art and recommendations. *Proceedings of the International Council for Open and Distance Education, Oslo 2015*, 52 S. Retrieved from https://www.pedocs.de/volltexte/2015/10879/pdf/Ossiannilsson_et_al_2015 _Qualitymodels.pdf

48. Paulk, M. C., Curtis, B., Chrissis, M. B., & Weber, C. V. (1993). *Capability maturity model for software, version 1.1* (Technical Report No. CMU/SEI-93-TR-024 ESC-TR-93-177). Software Engineering Institute. Carnegie Mellon University. Retrieved from https://resources.sei.cmu.edu/asset_files/TechnicalReport/1993_005_001_16211.pdf

49. Pöppelbuss, J., & Röglinger, M. (2011). What makes a useful maturity model? A framework of general design principles for maturity models and its demonstration in business process management. *Proceedings of the 19th European Conference on Information Systems (ECIS 2011)*, 1–12. Helsinki, Finland. Retrieved from https://eref.uni-bayreuth.de/id/eprint/8260

50. Professional Development Service for Teachers Technology in Education (n.d.). e-Learning roadmap [Web Portal]. Retrieved June 5, 2018, from http://www.pdsttechnologyineducation.ie/en/Planning/eLearning-Planning-Resources/

51. Reis, T. L., Mathias, M. A. S., & de Oliveira, O. J. (2017). Maturity models: identifying the state-of-the-art and the scientific gaps from a bibliometric study. *Scientometrics, 110*(2), 643–672. doi:10.1007/s11192-016-2182-0

52. Researching Virtual Initiatives in Education. (n.d.). ELPS [Web Page]. Retrieved June 1, 2018, from http://www.virtualschoolsandcolleges.eu/index.php/ELPS

53. Rossi, R. (2013). *eQETIC: modelo de qualidade para productos educacionais baseados nas tecnologias de informaçao e comunicaçao* [In Portuguese] (Doctoral dissertation). Universidade Presbiteriana Mackenzie, Sao Paulo, Brazil. Retrieved from http://tede.mackenzie.br /jspui/bitstream/tede/1522/1/Rogerio%20Rossi.pdf

54. Rossi, R., & Mustaro, P. N. (2015). eQETIC: a maturity model for online education. *Interdisciplinary Journal of E-Skills and Lifelong Learning, 11*, 11–23.

ISBN 978-615-5511-25-7

55. Rubens, W., & Kemps, A. (2007). The eportfolio landscape in dutch higher education (2006). In W. Aalderink, M. Veugelers, & S. N. Portfolio (Eds.), *Stimulating Lifelong Learning: The ePortfolio in Dutch Higher Education* (pp. 13–21). Utrecht: Stichting SURF. Retrieved from https://www.surf.nl/binaries/content/assets/surf/nl/kennisbank/ouder/Stimulating+Lifelong+Learning++ePortfolio.pdf

56. Scepanovic, S., Devedzic, V., & Kraljevski, I. (2011). E-learning and benchmarking: methodology and tools review. *Proceedings of the The Second International Conference on e-Learning (eLearning-2011),* 79–84. Belgrade, Serbia. Retrieved from http://econference.metropolitan.ac.rs/files/pdf/2011/23-snezana-scepanovic-vladan-devedzic-ivan-kraljevski-e-learning-benchmarking-methodology-and-tools-review.pdf

57. Soliman, T. (2008). Online teaching staff maturity model (OTMM) (pp. 211–215). *Proceedings of the 7th World Scientific and Engineering Academy and Society International Conference on E-ACTIVITIES, Cairo, Egypt*. Retrieved from http://www.wseas.us/e-library/conferences/2008/cairo/CD-E-ACTIVITIES/E-ACTIVITIES35.pdf

58. Stagg, A. (2014). OER adoption: a continuum for practice. *Universities and Knowledge Society Journal, 11*(3), 151. doi:10.7238/rusc.v11i3.2102

59. Tarhan, A., Turetken, O., & Reijers, H. A. (2016). Business process maturity models: a systematic literature review. *Information and Software Technology, 75*, 122–134. doi:10.1016/j.infsof.2016.01.010

60. Vollmer, J. (2003, April 9). The enterprise LMS market: where are we now? Clomedia [Blog post]. Retrieved June 25, 2018, from http://www.clomedia.com/2003/04/09/the-enterprise-lms-market-where-are-we-now/

61. Webster, J., & Watson, R. T. (2002). Analyzing the past to prepare the future: writing a literature review. *MIS Quarterly, 26*(2), xiii–xxiii.

62. Wendler, R. (2012). The maturity of maturity model research: a systematic mapping study. *Information and Software Technology, 54*(12), 1317–1339. doi: 10.1016/j.infsof.2012.07.007

63. Wentworth, D. (2014). *High performance mobile learning maturity model: framework for progress.* Brandon Hall Group.

64. Wild, J. (2012). *OER engagement study: promoting OER reuse among academics. SCORE Research Report.* University of Oxford & The Open University. Retrieved from https://askawild.files.wordpress.com/2017/09/oer-engagement-study-joanna-wild_full-research-report.pdf

65. Zawacki-Richter, O., & Anderson, T. (Eds.) (2014). *Online distance education. Towards a research agenda.* AU Press, Athabasca University. Retrieved from http://microblogging.infodocs.eu/wp-content/uploads/2014/07/Online_Distance_Education.pdf

66. Zhou, Y. (2012). Towards Capability Maturity Model of e-Learning Process. *Intelligent Information Management, 4*(4), 95–98. doi:10.4236/iim.2012.44015

ISBN 978-615-5511-25-7

Acknowledgements

This work has been supported by the Industrial Doctorates Programme – Generalitat de Catalunya (2014 DI 077).

ISBN 978-615-5511-25-7

Towards Personalized Guidance and Support for Learning
Proceedings of the 10th European Distance and E-Learning Network Research Workshop, 2018
Barcelona, 24-26 October, 2018
ISBN 978-615-5511-25-7

TOWARDS A STRUCTURED PROCESS FOR INVOLVING DISTRIBUTED TEACHERS IN FACILITATION STRATEGY DESIGN AND REVIEW

Ann Walshe, The Open University, United Kingdom

Summary

In universities, much emphasis is placed on continual professional development for teachers to ensure they have the required teaching competencies. Less emphasis is placed on capturing the professional expertise that teachers have developed in their practice, to inform strategies for achieving teaching excellence and the best possible student experience. In the context of online and distance education, where teachers are distributed, there is a need to develop a structured process whereby the voices of the distributed teachers can be heard and they are encouraged to feel a responsibility to engage in the process.

This paper describes a case study undertaken at the UK Open University (OU) with a view to developing a structured process for involving distributed tutors in the design and review of the tutorial provision. Tutor feedback was collected by a variety of means and fed into changes. Other feedback, not directly related to the tutorial provision, that was also captured should be acted upon to develop the tutor community of practice.

Context

In higher education, much emphasis is placed on delivering continual professional development to ensure that teachers have the required teaching competencies. Crawford (2010) focused on the importance of developing academic staff expertise through professional development. In the context of professional development, Crawford observed that the voices of academics were generally not being heard and recognised that their views should be included in the debate.

Teacher expertise is a resource that educational institutions should be utilising in their aspiration towards teaching excellence and the best possible student experience. "Staff expertise is the most important asset in a university; without it literally nothing can be achieved" (Blackmore & Blackwell, 2003; p.23, cited in Crawford, 2010). Teaching excellence is best achieved by fostering "a culture of quality and enhancement, through dialogue and collaboration" through "committed and passionate higher education staff working to a clear, shared vision and a common set of goals" (Marshall, 2017).

Teachers develop professional expertise in facilitating learning through their practice and experience. In the context of online and distance education where teachers are distributed, it

becomes more difficult to capture their expertise to inform teaching strategies. Some universities have created processes to facilitate peer review of good practice amongst distributed teachers, for example, a peer observation programme organised by the UK University of York's Distance Learning Forum (Walker, 2015).

In the UK Open University (OU), module materials are written by campus-based teams of academics called module teams. Tutors distributed across the UK are employed part-time to facilitate student learning. Thus the design for learning is separate from the facilitation of learning. Each tutor is allocated a group of students and facilitates learning in a number of ways one of which is to deliver synchronous tutorials to their group, also called group tuition, either face-to-face or in an online virtual classroom. Student attendance at tutorials is optional. Tutors traditionally used their professional judgement to adapt the timing and content of their tutorials to the needs of their own students. In 2016 the OU introduced a Group Tuition Policy whereby the timing and content of tutorials on a module would henceforth be specified by the module team in a document called the tuition strategy document (Table 1). Each module has its own tailored tuition strategy, with tutorial timing and content specific to the requirements of that module.

Table 3: A simplified extract from an early OU tuition strategy document

tutorial title	session length	timing	face-to-face or online	tutorial description
Introduction	1 hour	between weeks 1 and 3	online only	Introduction to the module, what it covers and its main goals. Study tips.
Coding in Python	2 hours	between weeks 4 and 10	face-to-face	This hands-on session will introduce Python through simple examples and exercises.

In this new system, students (and tutors) are provided with a description for each tutorial. The Group Tuition Policy aims to ensure that students understand the purpose of each tutorial and that all students receive a consistent tutorial experience. *Clusters* of tutors and their student groups are formed so that all tutorials given by the tutors in the cluster are available to all the student groups in the cluster. This gives students a wider choice of tutorials to attend and allows for tutors to collaborate, e.g. tutors can pair up to deliver a tutorial or different tutors can deliver tutorials on different topics. The tuition strategy is implemented by a tutorial timetable for each cluster (Table 2).

Table 2: A sample tutorial timetable for a cluster of two tutors and their student groups

tutorial title	session length	date and time	tutor(s)	face-to-face or online	tutorial description
Introduction	1 hour	10/10/2018 19:00 – 20:00	Tutor A	online	Introduction to the module, what it covers and its main goals. Study tips.
Introduction	1 hour	14/10/2018 13:30 – 14:30	Tutor B	online	Introduction to the module, what it covers and its main goals. Study tips.

ISBN 978-615-5511-25-7

Coding in Python	2 hours	07/12/2018 10:00 – 12:00	Tutor A, Tutor B	face-to-face	This hands-on session will introduce Python through simple examples and exercises.

There was no tutor input into the first tuition strategies created by the module teams. During the first year of using the new tuition strategies, the Vice Chancellor announced that tutors would be consulted on the effectiveness of these strategies, and their feedback would inform a tuition strategy review for every module.

Goodyear and Dimitriadis (2013) assert that design for learning should take into account the role of the teacher "at learntime" and should treat the teacher as "a knowledgeable, helpful actor" who can be depended upon to monitor students' learning and intervene where appropriate. An Open University project undertaken in 2017 found that tutors are experienced in delivering and reflecting on tuition, they have views on tuition, and they see the practice of delivering tuition as part of their professional identity (Walshe & Gallen, 2017).

This paper describes a case study undertaken at the OU with a view to developing a structured process for involving distributed tutors in tuition strategy design and review.

Method

The case study examined the review process for modules in the OU School of Computing and Communications (C&C), STEM Faculty. The university-wide review took place over a three-month period during the first year of implementation of the new tuition strategies. Each Faculty took responsibility for the review in its own Schools. The STEM Faculty provided a toolkit of issues to consider and questions and prompts for tutor consultation. Each school in the STEM Faculty, including C&C, used this toolkit.

Issues to consider included:

- Were the tutorial titles clear and informative?
- Did the tutorial descriptions provide appropriate information?
- Was the timing of the tutorials appropriate?
- How could the tuition strategy be improved to make it more effective?

Tutors in the OU are managed by academics called Staff Tutors, who have close links with, and may be members of, module teams. For the tuition strategy review, Staff Tutors worked with the module teams to consult tutors by a variety of methods, including synchronous online meetings, consultation threads on forums, and direct emails. For each module the methods used were chosen by the Staff Tutors and/or the module teams according to individual preferences. Feedback from the consultations was collected and considered. In the light of the collected feedback, the Staff Tutors and module teams used their academic judgement to decide on what revisions if any to make to the tuition strategies. In some cases, proposed revisions were posted on the forums for further tutor comment before being finalised.

ISBN 978-615-5511-25-7

Findings

The number of tutors on the modules included in the case study ranged from 6 up to around 30. Responders were self-selecting. Response rates ranged from 27% (7 out of 26) up to 83% (5 out of 6) of tutors on a module.

Although the intention had been to collect feedback about the tuition strategy designs, much of the feedback was about how the strategies had been implemented and some feedback was about other aspects of the tutor role.

Feedback on the tuition strategy designs included:

- Most tutorial titles were OK but some tutorials needed clearer labelling.
- Some tutorial descriptions needed to be reviewed and revised, for example, to clarify that the content could vary according to the needs of the students who attend and to tell students they will get more out of the session if they come with questions.
- Descriptions should be sufficiently broad to allow tutors to exercise their professional judgement. Tutorials can be organic and take a different, more student-relevant direction at times, which is the concept of creative teaching as structured improvisation (Sawyer, 2004).
- Some tutors felt that online sessions should be longer than one hour to allow more scope for interactive activities. Other tutors preferred shorter and more frequent online sessions. It was understood that session length can be varied by negotiation with the tutor when implementing the tuition strategy.
- A single tutorial should not try to cover too many topics.
- There was some doubt over whether students read the descriptions. There was a feeling among some tutors that students don't attend tutorials based on the descriptions. They trust the tutor to deliver appropriate tuition.

Feedback on implementing the tuition strategies included:

- Tutors would prefer to see a more even distribution of tutorials across the available time windows.
- Daytime sessions are a useful alternative to evening tutorials.
- Some tutors would like a standard set of resources and more guidance for each tutorial. There was a feeling that there must be a lot of duplication of work by different tutors preparing similar tutorials.
- On larger population modules there is greater scope for tutors to deliver tutorials in pairs because there are likely to be more tutors in a cluster.
- There was a willingness to trial new ideas next time round.
- Tutors often message their students with a more specific agenda for an upcoming tutorial.
- Attendance at some face-to-face tutorials was very low. Maybe an online tutorial would be better next time.
- The wider choice afforded to students did not always increase student uptake of tutorials.

ISBN 978-615-5511-25-7

- There was not always collaboration between the tutors in a cluster, particularly on established modules where tutors had already developed their individual tutorial practice. There was felt to be scope for greater collaboration. Finding time to plan collaboration was perceived to be a problem.

Not all tutors are of the same opinion. For example, views differ on whether an online tutorial should be longer than one hour. Some would like more guidance on tutorial content than others. This is to be expected depending on the experience and personal preferences of each tutor.

Resulting changes

Following the consultation, the resulting changes to the tuition strategies varied from module to module. Some tutorial descriptions were reworded. Some session lengths were changed. Sometime windows were widened. Overall the emphasis was on maximising flexibility for implementing the strategies.

Some sessions were split into separate sessions on different topics. On some modules, regular ad-hoc drop-in sessions were added, with no particular content, to help students with any questions or issues that had arisen.

There were no changes to some strategies where the feedback suggested the tutors were happy with the strategy as it was, and the feedback was more about the implementation than about the strategy itself.

Not all changes to the tuition strategies were a result of the tutor feedback. Module teams and Staff Tutors continue to develop their own views in the light of experience about how best to design tuition strategies, for example to maximise flexibility and not to inhibit the professional judgement of the tutors delivering the tuition. Some changes, in particular to the descriptions, appear to have been influenced by what other module teams were doing.

Discussion

The case study raises many new questions that need further exploration.

What is the best method of gathering feedback?

Consulting tutors by email does not allow for discussion between them. Discussion can evoke responses and enrich the feedback. A synchronous online meeting allows for participant discussion and a quick consultation. Providing the consultation questions in advance of the meeting enables participants to reflect and prepare their responses. Recording the meeting is a good way of documenting the discussion and allows the discussion to be revisited for reflection and consideration. A disadvantage of a synchronous meeting is the difficulty of finding a date and time to suit everyone. Although an asynchronous forum consultation takes longer because participants respond over a period of days or weeks, it allows time for reflection on points others have made before responding, as well as allowing for iterative

ISBN 978-615-5511-25-7

refinement of the reviewed strategy. The longer timeframe is more likely to enable all to participate. It is important to give deadlines for responses and to close the forum discussion at the end of the stated time period. An effective method of gathering feedback might be to start the discussion on a forum, then hold a synchronous online meeting and follow up with further forum discussion.

How can distributed teachers be encouraged to engage in the design and review process?

Feedback appears to be have been provided by a small proportion of the tutor cohort across the modules included in the case study. This can lead to bias in the feedback, since those who respond may not be representative of the views of the whole cohort. Crawford (2010) asserted that having the right to participate comes with an obligation to engage. One answer might be to include time in the tutor's contracted hours for engaging in design and review.

Is it easier to make the review process iterative when the group being consulted is relatively small?

Those tutors who did engage provided a wealth of feedback. The review process varied from module to module depending on the choices made by individual module teams and Staff Tutors. In some cases, the review was an iterative process where online discussions allowed further probing questions to be explored, further ideas to be generated and further discussion to refine the ideas. In other cases, the review was a sequential process with no iteration.

How can perceived needs of distributed teachers be captured and acted upon so as to develop a community of practice among the teachers?

Other feedback not directly related to the tuition strategy review was also collected during the review. For instance, some tutors felt that the new Group Tuition Policy was leading to an erosion of the tutor/student relationship. As a result of this feedback, some workshops were held by Staff Tutors for tutors to explore ways of nurturing the tutor/student relationship. In those workshops, further ideas emerged about how Staff Tutors can help nurture the tutor/tutor relationship, that is, nurture the tutor community of practice (Walshe, 2018).

Conclusion

This case study exemplified the value of capturing the professional expertise of distributed teachers. The consultation resulted in richer feedback and discussions than expected.

The next steps following the case study are to develop a structured process of consulting tutors, with recommendations for the methods of collecting feedback and using it to inform module strategy decisions and reviews. This process should be piloted in the C&C school before disseminating recommendations more widely across the Faculty and ultimately across the University.

ISBN 978-615-5511-25-7

Further work needs to be undertaken to develop the emerging ideas for nurturing the tutor community of practice.

Across the online and distance learning sector there is a need for structured processes to involve distributed teachers in design and review of strategies that affect their working practices. Distributed teachers are closer to the students than any other staff in the university. Their expertise gained from working with students should be harnessed to enhance teaching excellence for the benefit of the student experience. Consulting distributed teachers and facilitating discussion amongst them should lead to development of their community of practice.

References

1. Blackmore, P., & Blackwell, R. (2003). Academic roles and relationships. In R. Blackwell, & P. Blackmore (Eds.), *Towards strategic staff development in higher education* (pp. 16-28). Maidenhead, UK: SRHE and Open University Press.
2. Crawford, K. (2010). Influences on academics' approaches to development: voices from below. *International Journal for Academic Development, 15*(3), 189-202. doi: 10.1080/1360144X.2010.497669
3. Goodyear, P., & Dimitriadis, Y. (2013). In media res: reframing design for learning. *Research in Learning Technology Supplement, 21*(0), 1-13. doi: 10.3402/rlt.v21i0.19909
4. Marshall, Prof. S. (2017). *Rising to the challenges of tomorrow.* Published 1st November 2017 by Higher Education Academy. Retrieved August 8, 2018 from https://www.heacademy.ac.uk/knowledge-hub/rising-challenges-tomorrow
5. Sawyer, R. K. (2004). Creative Teaching: Collaborative Discussion as Disciplined Improvisation. *Educational Researcher, 33*(2), 12-20. doi: 10.3102/0013189X033002012
6. Walker, R. (2015). Peer observation for online distance learning tutors: Creating the conditions for effective peer exchange. *European Journal of Open, Distance and e-Learning, 18*(1), 34-51. doi: 10.1515/eurodl-2015-0003
7. Walshe, A. (2018). *Nurturing the Tutor-Student Relationship.* Open University Internal Report.
8. Walshe, A., & Gallen, A-M. (2017). *Perceptions, Expectations and Experience of Group Tuition: towards a shared understanding amongst stakeholders.* eSTEeM Final Report 2017, Open University Internal Report.

Acknowledgement

I would like to thank my OU colleagues Karen Kear and Helen Donelan for their constructive comments on earlier drafts.

ISBN 978-615-5511-25-7

Towards Personalized Guidance and Support for Learning
Proceedings of the 10th European Distance and E-Learning Network Research Workshop, 2018
Barcelona, 24-26 October, 2018
ISBN 978-615-5511-25-7

PERSONALISED AND MULTI-SENSORY APPROACHES TO ENGAGING STUDENTS AT A DISTANCE: A CASE STUDY FROM RELIGIOUS STUDIES

John Maiden, Stefanie Sinclair, The Open University, United Kingdom

Summary

This article critically evaluates the pedagogical value of peer-to-peer digital sharing of audio visual resources in a distance learning context. It does so through a case study exploring the use of OpenStudio, an innovative software developed by the Open University (UK). This platform allows students to upload their own images, sounds and texts to an interactive digital pinboard, where they are shared with other students and comments may be exchanged. The context for the use of OpenStudio was to support peer-to-peer group activities, both assessed and unassessed, in a Religious Studies course (A227 "Exploring Religion: Places, Practices, Texts and Experiences"). These activities were envisaged as a novel, experimental approach to offering students a highly personalised, multi-sensory opportunity to explore complex scholarly concepts, in particular the *materiality* of religion. OpenStudio would provide students with a means of learning through their own creativity and self-expression, and also that of others. The findings of this article draw on data critically evaluating the engagement and experiences of both students and tutors during the first presentation of the course, in order to assess the strengths and limitations of this approach to personalised learning through digital technologies.

Introduction

How can we use personalised and multi-sensory approaches to support students in grasping complex ideas, such as the concept of *religion* as a category of scholarly enquiry, and facilitate their critical engagement with relevant scholarly debates in distance learning environments? This was the pedagogical issue faced by members of the Religious Studies department at The Open University, in the United Kingdom, when they came to consider the design of the second year undergraduate course A227 "Exploring Religion: Places, Practices, Texts and Experiences" (hereafter, A227). One of the key developments in the study of religions has been the *material turn*, but this can be a strange concept for students who are used to conceptualising *religion* primarily in terms of abstract beliefs and worldviews. The material turn involves a greater focus on the sensory aspects of religion, such as the ways in which our bodies engage with places, objects and sounds. A227 aimed to encourage students to think beyond simplistic conceptualisations of *religion* and heighten students' awareness of the complexities of religion as it is lived, including the exploration of material, sensory aspects of religion. The pedagogical concern here was not only in response to the material "turn" in the

discipline of religious studies; but also in the context of a discussion about the value of object-based learning (Chatterjee et al., 2015) which has highlighted the value of multi-sensory, holistic learning experiences and of student engagement through a range of different learning styles (Kolb & Kolb, 2005). Course design also needed to consider how these aims could be achieved in a distance learning context. The Open University is the largest distance learning provider of Higher Education in the United Kingdom. As a non-conventional university, with many students from widening participation backgrounds, dispersed around the country, and abroad, and with much of its tuition strategy based on its online presence, there are few opportunities for field visits to religious sites or classroom engagement with physical objects. This paper outlines and critically evaluates the approach adopted by the designers of A227 to address these issues through the use of a peer-to-peer digital sharing tool called OpenStudio.

Context and rationale

OpenStudio is an online tool developed by the Open University, which allows students to share their own images, sounds and texts on an interactive digital pinboard and comment on each other's contributions. On this online platform, students' contributions are displayed next to each other with the comments shown underneath each image (or text/ sound recording). This makes it a lot easier to access, gain an overview and compare different contributions than it is, for example, on online forums. OpenStudio is a platform that was originally developed for a Digital Photography course and has since been used primarily in the context of science, technology and engineering courses (Rosewell, 2015).

OpenStudio was envisaged as a means of enabling a highly personalised approach to learning at a distance. More specifically, its use as part of this Religious Studies course was bound up with three specific pedagogical aims.

- The first was to use OpenStudio as a means of introducing students to some complex theories, concepts and themes in Religious Studies by enabling them to explore these through familiar places, sounds and objects in their own environment. For example, a student might upload a picture of their local football ground in order to discuss the spectrum of *religious* and the *secular*; or an image of an old church building which has been turned into apartments, in order to comment on secularization in a local setting; or to upload the sound of church bells as an example of the ways in which religions engage the human sensorium. A227 sought to create opportunities for students to consider, often for the first time, key concepts and themes in religious studies in a personalised way, by encouraging them to engage with and reflect on their own familiar context.
- Second, OpenStudio was used to encourage students' creativity, and specifically to engage them with multi-sensory learning and assessment to accommodate different learning styles and create richer, deeper learning experiences. Creativity is increasingly a priority amongst employers (Osmani et al., 2015; Rampersad & Patel, 2014; Robinson, 2011), and there is a significant corpus of literature on the relationship between creativity and critical thinking skills (Watts & Blessinger, 2017; p.226), imagination (Blessinger & Watts, 2017;

ISBN 978-615-5511-25-7

p.4) and intelligence (Kim, 2011; p.285). As Jackson has argued: "creative learning – learning to be creative – is an orientation and capability that all students could and most importantly should, develop while they are studying in higher education" (2017, p.ix). However, many HE institutions struggle with the pedagogy of creativity; furthermore, the creative process – *to make* – and its assessment is particularly challenging in a distance learning environment. The use of OpenStudio, and its facility to display and share sound recordings and digital photographs in particular, allows students to engage in creative ways with theoretical and thematic course content. As Del Siegle notes, the use of digital photography offers educators an "excellent opportunity to enhance their students' creative thinking and self-reflection" (2012; p.285), and there are a range of studies highlighting the capacity of the use of digital photography in higher education to facilitate enhanced student engagement and performance, such as Gleeson's (2014) study exploring digital photography projects in engineering.

- Third, in all this, A227 utilised OpenStudio in order to traverse some of the perceived limitations of distance learning. While various types of synchronous and asynchronous forums have long been used by distance HE institutions for group tuition, the platforms adopted have tended to produce student learning and interaction which is largely text or voice based. Open Studio, which the designers of A227 judged to offer an accessible, easy to use, and attractive means of sharing images and sounds, as well as text, also provided a means of creating online environments in which self-expression and learning between peers could take place. In the context of A227, it was envisaged that as students collaboratively produced these collections of images and collections of sounds, offering comment on each other's work and perhaps inspiring each other to think about religion in new ways, or even to make new images and recordings, Open Studio could provide a valuable opportunity for co-creation, developing students' communication skills.

Methodology

This study focuses on the use of OpenStudio in the course of the first presentation of A227, which ran over a period of nine months (from October 2017 to June 2018). In the Open University, teaching materials and assessment strategies are designed by a small group of academics (referred to as the "module team"), but courses are delivered and assessed by a larger group of tutors each teaching small groups of students across the UK (and beyond). Students used OpenStudio in the context of small online tutor groups which included approximately 20 students each. The software was used by students in four specific activities during the duration of the course:

- Activity 1: 'What is religion" activity (week 1). This was a formative activity, which asked students to upload a short, non-specialist definition of religion, in their own words. It was envisaged that this text based activity would develop students' familiarity with the software, and also give them an early experience of engagement with their peer group.
- Activity 2: "Take a picture of religion?" activity. This assessed activity took place in weeks 2-3 of the course. Initially, in week 2, students were asked to upload a picture of *religion* in

ISBN 978-615-5511-25-7

their locality and to add a commentary (100 words max) on "why it might tell us something interesting about religion". Students were also invited to comment on the images uploaded by other students. Then, in week 3, students were asked to complete their first summative, two-part assessment task. This required them, firstly, to expand on their initial commentary (in week 2) by explaining in 500 words how the image they took related to the course theme "What is religion?". Second, they were asked, also in 500 words, to reflect on the experience of taking part in the "Take a picture of religion" activity. It was suggested they might use this to discuss how the activity informed their understanding of what *religion* might be. They could also reflect on the process of taking an image and engaging with their local environment, or on their experiences of collaborative discussion with other students or on the negotiation of technical or practical difficulties.

- Activity 3: "Thinking about urban and religious change" activity (week 7). Students were again invited to explore their neighbourhood and take pictures, this times looking specifically for examples of secular buildings which had become religions buildings, and vice-versa. This was a formative activity, and students were invited to upload their images and commentaries on OpenStudio and to continue their interaction with other students on this platform.
- Activity 4: "What does religion sound like?" (week 23). In this final, formative activity students were this time invited to upload recordings (e.g. from their phones) which captured what religion might "sound like"; they were asked to include also a brief commentary of what the sound represented to them about religion, and also to comment on the recordings of other students.

Students in secure environments or those with accessibility issues were provided with a sample image bank (for the "Take a picture of religion" activity) and were given the option of describing sounds or objects in writing or discuss with their tutor of how they would be comfortable contributing to these activities.

The critical evaluation of the use of OpenStudio in the context of this course drew on three sources of quantitative and qualitative data. First, a total of 72 students who took part in the course were invited by e-mail to complete an online questionnaire on their experience of OpenStudio in A227, including a number of open and closed questions about each of the four OpenStudio activities. A total of 21 students responded, 16 with complete responses and 5 partially complete – which meant a 22.2% complete response rate. Second, semi-structured interviews were conducted by phone with four local tutors who had supervised the student groups in which the activities were completed. The interview consisted of *open questions*, designed to cover each specific OpenStudio activity, to allow comparison, but also including opportunities to reflect generally on student use of the software. Then, finally, we assessed quantitative data on student involvement in the activities. This included the number of students who took part in each activity; the number of students who left commentaries on their own submissions or on those of other students; the number of comments made by each student; how many peers' text, image or sound files were viewed by each student; or what

ISBN 978-615-5511-25-7

kinds of images were uploaded for the 'Take a picture of religion' activity (e.g. buildings, objects, nature etc.).

Findings

The analysis of student survey responses suggests that a significant proportion of students did indeed feel that the OpenStudio activities helped them with their learning on A227 and helped them critically engage with key theoretical concepts and reflect on existing knowledge and assumptions, including their prior assumptions about the concept of religion. This applied in particular to the two activities involving digital photography (Activities 2 and 3), though less so to the activities involving written definitions (Activity 1) or sounds (Activity 4). 61.1% of respondents felt that the "Take a picture of religion activity" (Activity 2) had helped them with their learning on A227, 57.1% felt this about the converted building activity (Activity 3, which also involved digital photography), 41.1% about Activity 1 (discussing written definitions of religion) and only 37.5% about Activity 4 (the sound activity). While the module team had envisaged Activity 1 (which involved "just" texts, rather than digital photography or sound recordings) as a more accessible, "easier" entry activity, many students did indeed find it harder to engage with this activity than with the activities involving digital photography. This was also reflected in the tutor interviews, with tutors stating, for example:

> *"The visual aspect made them more relaxed about commenting. It would be worth considering swapping OpenStudio Activities 1 & 2 for this reason." (A227 Tutor)*

The "Take a picture of religion" activity (Activity 2) received particularly positive feedback, with two thirds (66.7%) of the student survey respondents confirming that this activity had helped them critically engage with relevant theoretical concepts. Students commented, for example:

> *"It did make me think about religion in my locality as opposed to religion as a 'top down' phenomenon which I presume was part of the reason for doing it." (A227 Student)*

> *"I'm glad that TMA01 [the assignment linked to Activity 2] required me to engage intensely with the concept of religion. It opened my mind to other people's perceptions and led me down a very interesting and educative path." (A227 Student)*

> *"I found this kind of visual application to be a helpful way of learning. It placed the concepts in to an everyday context." (A227 Student)*

A tutor commented that they felt that this activity was particularly successful as "this was perhaps the only OpenStudio activity where there was a sense of genuine personal engagement" (A227 Tutor). Every student who responded to the survey had taken part in Activity 2 (which was linked to one of the assignments) and had taken and used their own

ISBN 978-615-5511-25-7

photographs. As students' open comments on the survey revealed, many students took great care with the selection of images for Activity 2 and were keen to approach it in creative ways, stating for example:

> *"This was a good opportunity for me to explore my own definition of religion. I was reluctant to take a picture of my local, pretty church, because I wanted to be more imaginative. If I could have found my chunk of the Berlin Wall, I'd have used that. I noticed that other students presented a mixture of obviously or less obviously religious objects. It was an interesting project, but it might have been more interesting (just a thought) if we had been given warning before the course began; there might have been photo opportunities on summer hols." (A227 Student)*

> *"I enjoyed thinking about the image that I could use for […this activity…] - I used my own image and enjoyed planning and taking it." (A227 Student)*

However, the quantitative analysis of the OpenStudio submissions to Activity 2 ("Take a picture of religion") showed that most students decided to *play it safe* in their selection of images. Of a total of 95 *pictures of religion* that A227 students submitted to the OpenStudio platform as part of this activity, 62 (i.e. 65.3%) were pictures of buildings, such as churches or mosques, which can be seen as a rather cautious approach, rather than creative interpretation of this task.

Open survey comments (including the quotes above) reflected a heightened sense of students' cognitive engagement with these activities. It is also important to note that survey responses indicated significant levels of emotional engagement, with a sizeable proportion of student survey respondents (Activity 1: 64.7%, Activity 2: 66.7%, Activity 3: 64.3% and Activity 4: 50%) stating that they either enjoyed or very much enjoyed taking part in the OpenStudio activities. As Vicky Trowler notes in her review of literature on student engagement, "Engagement is more than involvement or participation – it requires feelings and sensemaking as well as activity" (2010; p.5; see also Harper & Quaye, 2009). However, in the case of A227, it is also worth noting that two thirds (66.7%) of student survey respondents felt that the fact that Activity 2 was linked to an assignment had influenced the intensity of their engagement with this particular activity to a significant extent.

The fact that some students stated that they did not enjoy the OpenStudio activities nor found them particularly helpful indicates that these activities might appeal more to students with a greater preference for active visual learning styles. This might also explain why Activity 4, based on sounds, was not as popular. Some students also struggled with technical skills required, which is reflected in the following student comment:

> *"I know that you are trying to attract young people who are likely to be familiar with such technologies but I think that you should remember your older students (and I'm only 49) - all that faffing with unfamiliar technology*

ISBN 978-615-5511-25-7

> *may put them off even attempting the module in the first place. I certainly thought twice." (A227 Student)*

Another aspect were students' mixed attitudes towards and experiences of group work aspects of these activities. As reflected in the following comment, some students appreciated the engagement with peers as a very valuable aspect of the OpenStudio activities, stating, for example, that they "really enjoyed seeing other student's submissions and commenting on them" (A227 Student). However, others were concerned about how their submissions might be perceived by other students and felt that taking part in these activities "made them feel uncomfortable" (A227 Student):

> *"I was aware of the sensitivity of the subject. I didn't want to come across as being judgemental." (A227 Student).*

Other students regretted that their group was relatively quiet, stating, for example, that "there were very few posts in my tutorial group so it was difficult to engage" (A227 Student). The extent to which students commented on their peers' OpenStudio submissions was relatively limited, with each submission receiving an average of between 1.4 (for submissions to Activities 1 and 4) and 3.6 comments (which was the average for Activity 2), but considerably more views (ranging from an average of 3.8 views per submission for Activity 4 to 8.5 views per submission for Activity 2). This suggests that a proportion of students appear to have been curious about peers' uploads, but nervous about making comments themselves. Other students felt more comfortable and made a greater effort to enter into dialogue with other students, with 34.7% of the students taking part in these activities contributing 5 or more comments. In terms of both, numbers of views and comments on each submission, students generally engaged most intensively with Activity 2. This could be due to a number of factors, including the fact that this activity was linked to an assignment. However, only 38.9% of survey responds felt that this activity helped them develop their communication skills and the same (relatively small) proportion felt that this activity helped them to engage and work with other students.

Conclusion

The findings of this case study suggest that digital platforms like OpenStudio can offer valuable opportunities to introduce students in distance learning environments (and beyond) to complex theories, concepts and themes and facilitate student engagement with relevant concepts and debates through the use of personalised audio-visual resources, selected by the students themselves. OpenStudio, and the opportunities this digital platform offers for creative, personalised use and exchange of audio visual resources, can be used to support students' creativity, and engage them with multi-sensory learning and assessment accommodating different learning styles and creating richer, deeper learning experiences, even at a distance. However, it appears that the OpenStudio platform is most suitable for the exchange of visual resources, such as digital photography, rather than written texts or sounds. While the module team had expected that text-based activities would be a softer entry point,

ISBN 978-615-5511-25-7

the project findings suggest that most students found it actually easier to engage with OpenStudio activities involving images. While the group work elements of these OpenStudio activities have received some mixed responses from students, they have great potential, which will need some further development.

References

1. Blessinger, P., & Watts, L. S. (2017). History and nature of creative learning. In L. S. Watts & P. Blessinger (Eds.), *Creative Learning in Higher Education: International Perspectives and Approaches* (pp.3-13). New York and London: Routledge.
2. Gleeson, M. (2014). Analysing the Impact of Digital Photography Projects on Student Engagement and Performance in a Higher Education Discipline. *ICERI2014 Proceedings, Dublin Institute of Technology*, 5623-5633. Retrieved from https://arrow.dit.ie/cgi/viewcontent.cgi?referer=https://www.google.co.uk/&httpsredir=1&article=1024&context=engineduccon
3. Harper, S. R., & Quaye, S. J. (2009) Beyond Sameness, with Engagement and Outcomes for All. In *Student Engagement in Higher Education* (pp. 1–15). New York and London: Routledge.
4. Jackson, N. (2017). Foreword. In L. S. Watts & P. Blessinger (Eds.), *Creative Learning in Higher Education: International Perspectives and Approaches* (pp. ix-xxiii). New York and London: Routledge.
5. Kim, K. H. (2011). The creativity crisis: The decrease in creative thinking scores on the Torrance scale for creative thinking. *Creativity Research Journal, 23*(4), 285-295.
6. Kolb, A. Y., & Kolb, D. A. (2005). Learning Styles and Learning Spaces: Enhancing Experiential Learning in Higher Education. *Academy of Management Learning & Education, 4*(2), pp. 193-212. Retrieved from https://people.ok.ubc.ca/cstother/Learning%20Styles%20&%20Learning%20Spaces.pdf
7. Osmani, M., Weekrakkody, V., Hindi, N. M., Al-Esmail, R., Eldabi, T., Kapoor, K., & Irani, Z. (2015). Identifying trends and impact of graduate attributes on employability: a literature review. *Tertiary Education and Management, 21*(4), 367-379.
8. Rampersad, G., & Patel, F. (2014). Creativity as a desirable graduate attribute: implications for curriculum design and employability. *Asia-Pacific Journal of Cooperative Education, 15*(1), 1-11. Retrieved from http://www.apjce.org/files/APJCE_15_1_1_11.pdf
9. Robinson, K. (2011). *Out of Our Minds: Learning to be creative* (2nd revised ed.). Chichester: Capstone.
10. Rosewell, J. (2015, February 27). Digital photography: creating and sharing better images [Blog post] OpenStudio in STEM Learning. Retrieved from http://www.open.ac.uk/blogs/OpenStudioinSTEMLearning/

ISBN 978-615-5511-25-7

11. Siegle, D. (2012). Using Digital Photography to Enhance Student Creativity. *Gifted Child Today, 5*(4), 285-289.
12. Trowler, V. (2010). *Student Engagement Literature Review.* York: Higher Education Academy. Retrieved from https://www.heacademy.ac.uk/system/files/studentengagementliteraturereview_1.pdf
13. Watts, L. S., & Blessinger, P. (2017). The future of creative learning. In L. S. Watts & P. Blessinger (Eds.), *Creative Learning in Higher Education: International Perspectives and Approaches* (pp. 213-230). New York and London: Routledge.

Acknowledgement

We would like to thank Stuart Foyle for his contribution to the analysis of the data gathered as part of this case study.

ISBN 978-615-5511-25-7

Towards Personalized Guidance and Support for Learning
Proceedings of the 10th European Distance and E-Learning Network Research Workshop, 2018
Barcelona, 24-26 October, 2018
ISBN 978-615-5511-25-7

SELECTING THE BEST OPEN ACCESS JOURNAL ARTICLES: TO WHAT EXTENT DOES THIS GO BEYOND BEING A SUBJECTIVE EXERCISE?

Mark Brown, Eamon Costello, Mairead Nic Giolla Mhichil, Dublin City University, Ireland

Summary

At the end of 2016 and 2017 a team of staff in the National Institute of Digital Learning (NIDL) at Dublin City University (DCU) published a list of what it judged to have been the top 10 open access journal articles produced in the general area of Blended, Online and Digital (BOLD) education over the course of each year. The purpose of the initiative was to more widely flag valuable professional readings to those working in the field and to promote debate and further knowledge of new and emerging research in area. A secondary internal objective was to help raise awareness and encourage members of the NIDL team to more deeply engage with published literature. This paper critically reflects on both the value and usefulness of this exercise, including the selection criteria, chosen methodology and validity of our top 10 selections. It briefly describes and offers an analysis of the selected articles and then invites discussion on the trustworthiness of our selections and feedback on some of the wider lessons arising from the initiative. In particular, the paper identifies and reflects on the blurring of boundaries between open and closed publications, the growth of review and meta-analysis articles, and the continuing value of traditional restricted publications. Finally, in the spirit of Richard Steele, a great Irish writer and co-founder of "The Spectator", who claimed that "Reading is to the mind what exercise is to the body", we invite critical self-reflection on the most important features of a really good journal article.

Introduction

A wealth of literature is published annually in the general area of Blended, Online and Digital (BOLD) Education. For example, Perkins and Lowenthal (2016) report in their comprehensive analysis of publications in the field that there are over 270 open access journals alone. The challenge is that we are all busy researchers and professional educators and when combined with the grey literature—blogs, press releases, electronic newsletters, to name a few—it is virtually impossible to keep up-to-date with everything that is published in the area. To help address this problem over the past two years the National Institute of Digital Learning (NIDL) at Dublin City University (DCU) has published on its blog (https://nidl.blog) a list of what it deems to have been the top 10 open access journal articles produced over the course of each year. However, this exercise has raised a number of interesting questions:

- What selection criteria do you adopt to help identify a really good (open access) journal article?
- What selection methodology do you use to help identify the top 10 (open access) journal articles for the year?
- Who do you involve in the selection process to help enhance the validity of the list of top 10 (open access) journal articles?

With the above questions in mind the next part of this paper briefly describes the selection criteria and methodology adopted to arrive at our top 10 (open access) journal articles for each year.

Selection criteria

When the NIDL team first began this task in 2016 the truth is that we did not have any clearly defined selection criteria. Lack of explicit criteria was partly in the interests of promoting inclusion and recognition of the fact that we all have different interests and perspectives. However, we recognised the subjective nature of our selection process and therefore when we began the nomination process in 2017 we understood the value of more explicitly anchoring our selection in guiding criteria (NIDL, 2017a). Accordingly, in 2017 the final selection of the top 10 open access journal articles was guided or informed by the following inclusion criteria:

- Published in open access journals listed on NIDL website.
- Restricted to Higher Education articles (inclusive of teacher education).
- Strong preference to journal articles with international focus or relevance.
- Minor preference to journal articles published by professional associations.
- Strong preference to journal articles offering major literature reviews.
- Strong preference to journal articles addressing major gaps in the literature.
- Minor preference to journal articles exploring new and emerging research topics.
- Strong preference to journal articles which challenge conventional thinking.
- Minor preference to journal articles relevant to current NIDL's projects.
- Overall selection of top 10 journal articles reflects a mix of gender, cultural and geographical diversity.

Implicit in the final criterion was an effort to recognise wherever possible the work of new and emerging scholars. We also recognised the value of broadly anchoring the selection criteria around the four main platforms of DCU's Research and Innovation Framework which focuses on fostering innovation, promoting engagement with enterprise, and contributing to societal and economic impact. More specially, set within the wider context of this framework the intention was to give at least some recognition to the five broad strands that encapsulate the NIDL's main research interests: (a) lifelong learning, (b) opening up education, (c) student transitions and success, (d) learning and teaching transformations, and (e) education futures. That said, in practice this particular criterion was not something that played a crucial role in the selection process, partly reflecting the extent with which the above foci actually live in the NIDL's research activities.

ISBN 978-615-5511-25-7

Selection methodology

The selection methodology over both years involved a nomination process open to around 20 members of the NIDL team (NIDL, 2017a). While the primary objective of the exercise was to flag valuable professional readings to those working in the field a related aim was to raise awareness and encourage NIDL team members to more deeply engage with the published literature. A shared Google drive folder for the collection of nominated top journal articles was established for this purpose at the beginning of each year. In addition to this open nomination methodology when the more formal selection process began at the start of November, the Director systematically went through the full list of open access journals maintained on the NIDL's website (https://www.dcu.ie/nidl/resources/online-journals.shtml) to help identify specific journal articles which might qualify for inclusion in the long-list. Using this dual selection strategy by the end of November the authors then took responsibility as the steering group for selecting a more discerning short-list of top articles for the year. This list was further refined to a draft selection of 10 articles which NIDL team members were then invited to rank in order of merit keeping in mind the selection criteria and wider readership value. During this period the draft top 10 list was relatively dynamic as the ranking process tended to engage more staff and usually led to additional nominations. Moreover, a handful of new journal issues published late in the year needed to be included in the sample. As a consequence, during the process in both years a number of articles in the original list was replaced with late additions, which posed some challenges in the ranking methodology. Our willingness, nevertheless, to consider new articles missed in the original nomination process or incorporate those published late in the year is evidence of the inclusiveness of our selection methodology.

Top 10 selections

Our final selection of top 10 open access articles for 2016 is shown in Table 1. The top article appears in the "Australasian Journal of Educational Technology" and two articles in the top 10 were published in "Online Learning Journal and Research in Learning Technology" respectively. Between them these five articles represent publications managed or supported by the major professional bodies in Australia, United Kingdom and the United States. Article No. 8 exploring the concept of Sociable Scholarship is a good example of a thought-provoking selection that met the criterion of challenging conventional thinking. Lastly, it is noteworthy that half of the selected articles provide major literature reviews or analyses of important research trends.

Table 2 shows the final selection of top 10 open access articles for 2017 (NIDL, 2017b). Notably, the top 10 articles come from just five well-known journals. Partly by design, with one notable exception, once again professional associations manage or publish the majority of these journals. The standout exception is the "International Review of Research in Open and Distributed Learning", which notably has three articles in the top 10 and in most credible citation indexes continues to be ranked as one of the top five journals (open and closed) in the field. The only other publication not managed by a professional association is the

ISBN 978-615-5511-25-7

"International Journal of Educational Technology in Higher Education" published by Open Springer.

Table 1: Top 10 open access journal articles selected for 2016

Rank	Title	Author	Journal
1.	Open Access Journals in Educational Technology: Results of a Survey of Experienced Users	Ross A. Perkins & Patrick R. Lowenthal	Australasian Journal of Educational Technology
2.	Mapping Research Trends from 35 years of Publications in Distance Education	Olaf Zawacki-Richte & Som Naidu	Distance Education
3.	Different Views on Digital Scholarship: Separate Worlds or Cohesive Research Field?	Juliana E. Raffaghelli, Stefania Cucchiara, Flavio Manganello, & Donatella Persico	Research in Learning Technology
4.	Research Trends in Massive Open Online Course (MOOC) Theses and Dissertations: Surfing the Tsunami Wave	Aras Bozkurt, Nilgun Ozdamar Keskin & Inge de Waard	Open Praxis
5.	A Systematic Analysis and Synthesis of the Empirical MOOC Literature Published in 2013–2015	George Veletsianos & Peter Shepherdson	International Review of Research in Open and Distributed Learning
6.	Learning Analytics Methods, Benefits, and Challenges in Higher Education: A Systematic Literature Review	Sandra Nunn, John T. Avella, Therese Kanai & Mansureh Kebritchi	Online Learning Journal
7.	Open Educational Resources and College Textbook Choices: A Review of Research on Efficacy and Perceptions	John Hilton	Educational Technology Research and Development
8.	Sociable Scholarship: The Use of Social Media in the 21st Century Academy	Cat Pausé & Deborah Russell	Journal of Applied Social Theory
9.	Reaching the Unreached: De-mystifying the Role of ICT in the Process of Doctoral Research	Kwong Nui Sim & Sarah Stein	Research in Learning Technology
10.	Retention, Progression and the Taking of Online Courses	Scott James, Karen Swan & Cassandra Daston	Online Learning Journal

It is interesting to note that two journals each provide three of the top 10 articles—namely, the "Online Learning Journal" (Nos. 4, 5, & 8) published in the United States by the Online Learning Consortium (OLC) and the "International Review of Research in Open and Distributed Learning" (Nos. 2, 3, & 7) published by Athabasca University. However, once again our No. 1 article for 2017 comes from the "Australasian Journal of Educational Technology" published by the Australasian Society for Computers in Learning in Tertiary Education (ASCILITE). Two articles from this journal appear in the 2017 list. A version of our top article was also published later in the year in "Online Learning Journal" but a decision was taken not to include two publications reporting the same research in the list of top articles for the year. The two remaining articles in the list come from more traditional publishers: the

ISBN 978-615-5511-25-7

traditionally closed "tier 1" Taylor & Francis journal Distance Education, which was first launched in 1980 and is managed by the Open and Distance Learning Association of Australia (ODLAA); and the "International Journal of Educational Technology in Higher Education", which was re-launched by Open Springer in 2016 with a new name (previously RUSC Universities and Knowledge Society Journal) under continuing leadership of Universitat Oberta de Catalunya, Spain.

Further analysis of the 2017 list shows that most of the chosen articles were co-authored (n = 7), with a total of 22 authors (n = 25 in 2016). Two authors appear twice in the list and also feature in both the 2016 and 2017 lists (i.e., Bozkurt & Zawacki-Richte). A reasonable geographical spread of authors appears across developed and developing countries but across both year women author less than 40% of papers. Once again, publications managed or supported by professional associations figure prominently. Six of the top 10 articles are published in journals supported by major professional bodies, which serves to illustrate the valuable role they play in actively promoting open access scholarship and the wider dissemination of research. That said, there are some important open access journals from major professional bodies missing from the 2017 list, including "EDUCAUSE Review", "Open Praxis", "Research in Learning Technology", and the "European Journal of Open, Distance and eLearning", which should not be overlooked in judging the value and validity of our selections. Notably, to date "EDUCAUSE Review" and the "European Journal of Open, Distance and eLearning" have yet to have articles appear in our top 10 selections.

While the final list of top 10 articles for 2017 cover a wide range of topics and arguably provide a solid foundation for postgraduate students undertaking research in the area there are some notable gaps. For example, learning analytics, mobile learning, personalised learning, professional development, quality enhancement, micro-credentials and the unbundling movement, to name the most obvious, are important research themes missing from the top 10.

Table 2: Top 10 open access journal articles selected for 2017

Rank	Title	Author(s)	Journal
1.	Blended Learning Citation Patterns And Publication Networks Across Seven Worldwide Regions	Kristian Spring & Charles Graham	Australasian Journal of Educational Technology
2.	Review and Content Analysis of International Review of Research in Open and Distance/Distributed Learning (2000–2015)	Olaf Zawacki-Richte, Uthman Alturki & Ahmed Aldraiweesh	International Review of Research in Open and Distributed Learning
3.	Trends and Patterns in Massive Open Online Courses: Review and Content Analysis of Research on MOOCs (2008-2015)	Aras Bozkurt, Ela Akgün-Özbek, & Olaf Zawacki-Richter	International Review of Research in Open and Distributed Learning
4.	Theories and Frameworks for Online Education: Seeking an Integrated Model	Anthony G Picciano	Online Learning Journal
5.	A Critical Review of the Use of	Sedef Uzuner Smith,	Online Learning Journal

ISBN 978-615-5511-25-7

	Wenger's Community of Practice (CoP) Theoretical Framework in Online and Blended Learning Research, 2000-2014	Suzanne Hayes & Peter Shea	
6.	Refining Success and Dropout in Massive Open Online Courses Based on the Intention–behavior Gap	Maartje A. Henderikx, Karel Kreijns & Marco Kalz	Distance Education
7.	Special Report on the Role of Open Educational Resources in Supporting the Sustainable Development Goal 4: Quality Education Challenges and Opportunities	Rory McGreal	International Review of Research in Open and Distributed Learning
8.	A National Study of Online Learning Leaders in US Higher Education	Eric Fredericksen	Online Learning Journal
9.	Bot-teachers in Hybrid Massive Open Online Courses (MOOCs): A post-Humanist Experience	Aras Bozkurt, Whitney Kilgore & Matt Crosslin	Australasian Journal of Educational Technology
10.	Gamifying Education: What is Known, What is Believed and What Remains Uncertain: A Critical Review	Christo Dichev & Darina Dicheva	International Journal of Educational Technology in Higher Education

Finally, an unanticipated observation arising from this exercise over both years was the relatively low number of authors who had no or limited presence on Twitter. Wherever possible over December when progressively tweeting news of the top 10 articles we tried to include the author's Twitter handle—partly to alert them to their inclusion in this list. In 2017, based on our best efforts to locate relevant Twitter handles, as notably none of the journals appear to include this information in standard contact details for authors, just over half of the 22 contributors appear to have Twitter accounts. More to the point, few of these authors are particularly active Twitter users (n = 4), which is a little surprising given the nature of their work in the area and what appears to be a conscious decision to disseminate their research through open access publications along with what is known in terms of potential for increased citations when academics tweet their work. This apparent disconnection may be worthy of further investigation in future years.

A more detailed explanation of specific reasons for choosing each article and the perceived contributions they make to research and new knowledge in the area is contained in the NIDL (2017b) blog post announcing the list of top 10 open access publications.

Wider insights and lessons

This section critically reflects back on the exercise and offers three insights or major lessons arising from the top 10 open access article selection process over the past two-years.

Blurring of boundaries

Firstly, there appears to be an increasing blurring of boundaries between open and more traditional closed publications. During the selection process the question arose, what constitutes an open access article? Our second ranked 2016 and fifth ranked 2017 article, for

ISBN 978-615-5511-25-7

example, appears in a highly ranked closed journal published by Taylor & Francis which is managed by a professional association (i.e., ODLAA). It is noteworthy that the publisher now provides an *open select* service where the author(s) have the option of paying a fee to ensure downloads of their article are freely available. In contrast, authors are not required to pay anything when publishing their work in the "International Journal of Educational Technology in Higher Education", which is published by Open Springer. In the former case we decided to include such publications for consideration in our NIDL list of top 10 articles, as we wanted to recognise authors who demonstrate a commitment to openness and more widely disseminating their work.

The question of what constitutes an open access publication also arose with pre-print uploads of articles by authors to institutional open repositories and academic focussed websites (e.g., Research Gate). This question resulted in considerable debate amongst some members of the NIDL team, especially when the pre-print article went on to be published in a closed journal. For example, this issue came up when we considered an interesting article by George Veletsianos on who participates on MOOC hashtags and in what ways in trying to develop a generalizable understanding of Twitter and social media use. Although a pre-print version of the article is openly available from "ResearchGate", and on the author's personal blog, the final version (Veletsianos, 2017) appears in the "Journal of Computing in Higher Education". After much debate we decided to exclude this publication.

Similarly, on the theme of MOOCs we had to consider how to handle a useful publication on designing Massive Open Online Courses to take account of participant motivations and expectations, which was available as a pre-print version on Gilly Salmon's personal blog. The final version of this article (Salmon, 2017) appears in the "British Journal of Educational Technology". In the end, once again, after carefully reflecting on this issue, we decided to exclude the article from our list. However, we appreciated what appears to be a deliberate effort on the part of some scholars to disseminate their research through both open and closed publications, which we speculate from our own experience may be influenced by traditional rules or institutional definitions of what counts as high quality tier 1 research outputs. The lesson from these examples is that some scholars are strategically navigating and intentionally managing both open and closed publication spaces to help more widely disseminate their work. We think this serves as a valuable model for our own NIDL team and other scholars working in the area, especially if they wish to enhance the wider impact of their research.

Growth of review articles

Secondly, there appears to be a growing trend and increasing popularity towards the publication of review articles on topical issues following a systematic review methodology. For example, amongst the list of nominations for 2017 we considered Krull and Duart's (2017) article reporting a systematic review of research on mobile learning in higher education. Similarly, we also considered Liyanagunawardena, Scalzavara, and Williams' (2017) article in the "European Journal of Open, Distance and eLearning" reporting a systematic review of

ISBN 978-615-5511-25-7

literature on open badges. In addition, Mnkandla and Minnaar's (2017) meta-synthesis of the literature on the use of social media in e-learning was considered for inclusion, particularly given our preference in the selection criteria for identifying major review articles. Also, with its interesting focus on how authors collaborate in written publications in the area of e-learning, we considered Mohammadi, Asadzandi, and Malgard's (2017) paper in the "International Review of Research in Open and Distributed Learning" analysing articles in the Web of Science over a 10-year period.

While all of the above publications explore important topics, and as reported above our final selection of top 10 articles for both 2016 and 2017 include a reasonable number of major literature reviews, the standout observation from evaluating this type of work is that not all review articles are created equally. Polanin, Maynard, and Dell (2017) support this observation in their critical analysis of this line of research where they report, "Despite their popularity, few guidelines exist and… overviews are a relatively nascent and undeveloped synthesis method that pose unique methodological challenges and may be problematic" (pp.172-173). Building on this concern and Grant and Booth's (2009) typology of 14 literature review types and different methodologies we concluded that researchers' decisions about how they review the literature are never neutral. They invoke and sometimes conceal particular biases and assumptions about what they value (or not) as trustworthy research. The challenge for readers is to critically interpret such major literature review articles in terms of whether they justify the chosen methodology and make explicit their theoretical assumptions.

To state this point another way the lesson is that we need to go beyond potentially closet positivist and narrow instrumentalist methods, which arguably new software solutions make easier and enable new novel forms reporting. In other words, literature reviews that merely describe what has been published typically fail to provide a critical theoretical analysis of the field. Not all of the major review articles we include in our NIDL top 10 lists over the two-years fully address these points.

Value of closed publications

Thirdly, despite the focus of this exercise being on open access publications, which is both philosophical and pragmatic as we want as many people as possible to be able to access these articles, including members of our own NIDL team, many of the so-called best articles (depending on your personal selection criteria) appear to feature in more traditional closed journals. Put another way, our list of top 10 reads for the year would be very different if we adopted a hybrid sample of both open and closed publications. This point begs the question, what might we have included or at least considered in our selection from a wider sample of more traditional closed or restricted journals? This is a difficult question to answer without adopting a systematic selection methodology; however, after this question arose we published on the NIDL (2017b) blog an alternative list of closed publications that we may have considered for our top 10, although it needs to be stressed they were selected without following a defined methodology and many other journal articles would be worthy of

ISBN 978-615-5511-25-7

consideration. The lesson is that educators who do not have the luxury of access to traditional closed publications may be missing out on valuable literature with potential to influence future research, theory and practice.

Conclusion

This paper describes a selection process over 2016 and 2017 of what the NIDL team judged to be the top 10 open access journal articles published in the general area of Blended, Online and Digital (BOLD) education over the course of each year. In so doing the paper outlines the selection criteria, chosen methodology and critically reflects on the common and distinguishing characteristics of the sample of top 10 selections. A number of lessons arising from this exercise are shared but the question remains whether the two lists of NIDL top 10 open access journal articles provide valuable and trustworthy insights into the field or merely represent a subjective collection of publications from the wealth of literature annually published in the area. While we invite others to judge the value of this exercise for themselves "if reading is to the mind what exercise is to the body", then extending this analogy the central point or underlying message of this paper is that not all exercise should be assumed to offer the same health benefits.

References

1. Grant, M., & Booth, A. (2009). A typology of reviews: An analysis of 14 types of review types and associated methodologies. *Health Information and Libraries Journal, 2*, 91–108.
2. Krull, G., & Duart, J. (2017). Research trends in mobile learning in higher education: A systematic review of articles (2011 – 2015). *International Review of Research in Open and Distributed Learning, 18*(7), 1-23.
3. Liyanagunawardena, T., Scalzavara, S., &. Williams S. (2017). Open badges: A systematic review of peer-reviewed published literature (2011-2015). *European Journal of Open, Distance and eLearning, 20*(2), 1-16.
4. Mnkandla, E., & Minnaar, A. (2017). The use of social media in e-Learning: A metasynthesis. *International Review of Research in Open and Distributed Learning, 18*(5), 227-248.
5. Mohammadi, A., Asadzandi, S., & Malgard, S. (2017). A Survey of the Collaboration Rate of Authors in the E-Learning Subject Area over a 10-Year Period (2005-2014) Using Web of Science. *International Review of Research in Open and Distributed Learning, 18*(2), 252-263.
6. National Institute for Digital Learning (2017a, December 4). Selecting our top 10 articles: What was worth reading in 2017? [Blog post]. Retrieved from https://nidl.blog/2017/12/04/selecting-our-top-10-articles-what-was-worth-reading-in-2017/

ISBN 978-615-5511-25-7

7. National Institute for Digital Learning (2017a, December 20). The top 10 for 2017: Full list of articles and additional reflections. [Blog post] Retrieved from https://nidl.blog/2017/12/20/the-top-10-articles-for-2017-the-full-list-and-additional-reflections/
8. Perkins, R., & Lowenthal, P. (2016). Open access journals in educational technology: Results of a survey of experienced users. *Australasian Journal of Educational Technology, 32*(3), 18-37. Retrieved from https://ajet.org.au/index.php/AJET/article/view/2578/1358
9. Polanin, R., Maynard, B., & Dell, N. (2017). Overviews in education research: A systematic review and analysis. *Review of Educational Research, 87*(1), 172–203. Retrieved from http://journals.sagepub.com/doi/abs/10.3102/0034654316631117
10. Salmon, G. (2017). Designing Massive Open Online Courses to take account of participant motivations and expectations. *British Journal of Educational Technology, 48*(6), 1284-1294. Retrieved from http://onlinelibrary.wiley.com/doi/10.1111/bjet.12497/abstract
11. Veletsianos, G. (2017). Toward a generalizable understanding of Twitter and social media use across MOOCs: who participates on MOOC hashtags and in what ways? *Journal of Computing in Higher Education, 29*, 65–80. Retrieved from https://link.springer.com/article/10.1007/s12528-017-9131-7

ISBN 978-615-5511-25-7

Towards Personalized Guidance and Support for Learning
Proceedings of the 10th European Distance and E-Learning Network Research Workshop, 2018
Barcelona, 24-26 October, 2018
ISBN 978-615-5511-25-7

REVISITING THE TRANSACTIONAL DISTANCE THEORY: A QUALITATIVE STUDY OF TWO WEB-BASED DISTANCE LEARNING COURSES AT A CAMPUS-BASED UNIVERSITY

Palitha Edirisingha, Mengjie Jiang, University of Leicester, United Kingdom

Summary

This paper is concerned with the use of Moore's Theory of Transactional Distance as a way of understanding the factors contributing to students' learning experience. The paper presents an initial reflections based on a small-scale study of two post graduate level distance learning courses offered by a conventional university in the UK (University of Leicester). The objective of the research was to gain an in-depth insight into the characteristics of the three variables of distance education proposed by Moore (1972, 2013), namely 'structure', 'dialogue' and 'autonomy', and to identify associations are there among three variables.

Moore's Theory of Transactional Distance

Moore's theory of Transactional Distance (TTD) (Moore, 1973, 2013) is one the early theories of distance education (DE) which captures the essential features of distance education. It defines the field in pedagogical terms (Moore, 2013; p.67. italics original) and considers DE in terms of three variables (*structure*, *dialogue*, and *autonomy*) highlighting distance education as a distinct form of academic practice, not something that needs to be benchmarked against campus-based offerings. Drawing from Boyd and Apps (1980) idea of *transactional distance*, Moore drew our attention to a transactional distance (TD) that students experience when they learn at a distance; this TD is the sum result of the aforementioned three key variables of a course that interact with or influence one another. The TD is a "psychological and communications space to be crossed, a space of potential misunderstanding between the inputs of instructor and those of the learner" (Moore, 1980; p.3).

According to Moore (2013) *structure* is the level of specification on a range of aspects of a course, e.g., the lessons, the curriculum, learning objectives, the design of learning material and activities, teaching strategies, assessment methods, accommodation / responsiveness to learners' individual needs and preferences, advise on learning, assessment, sequence of following content. Dialogue is "a particular kind of interpersonal interaction, and it happens after a course is designed, …, aimed at the latter's creation of knowledge". Autonomy is the ability for students to "develop personal learning plan, to find resources for them study in their work community environments, and to evaluate for themselves when progress was satisfactory" (ibid.; p.72).

The literature on transactional distance theory suggests that the theory has gained traction since its origin and served as a conceptual tool for many researchers to examine the practices of DE using a range of methods. Moore (2003) synthesise a large body of research carried out from 1998 – 2005 and 47 significant research projects published between 2006 – 2011.

Critiques of the TDT and the objectives of the research

While acknowledging the contribution of TDT to the field of distance education, Gorsky and Capsi (2005) offer a substantial critique of TDT. The space in this paper is limited to review these critiques, but the following sums up one of their main critiques: "Moore (1993) did not define any of the theory's constructs operationally. This led some researchers to use operational definitions that differed meaningfully from the formal ones, thereby severely compromising construct validity. By Moore's own definitions, dialogue is not the number of verbal interactions that occurred and transactional distance is not a perceived value of 'closeness'" (ibid.; p.7). They add that "Very few researchers have carried out the empirical studies to test the validity of its key constructs and, especially the relationships among them", and "Of the few they found, their validity was extremely limited" (ibid.; p.3).

Based on our reading of Moore's TDT (2013) and research carried out using TDT as well as Gorsky and Capsi (2005) we also see issues of operationalising the three key variables of TDT (*structure*, *dialogue*, and *autonomy*) and understanding their relationship with one other. The variable *Structure* includes many aspects of a programme that need to be considered as individual components. The relationship between the *structure* and *dialogue* is also a difficult one to comprehend. Moore's statements such as "With a high degree of structure and little or no dialogue, the transactional distance is high" (Moore, 2013; p.71. italics for emphasis) and "In a course with low structure and high dialogue, i.e., low transactional dialogue, …" (ibid.; p.73) implies a causal, inverse relationship between the structure and the dialogue. But this doesn't have to be the case.

We propose to investigate the three factors in the context of a number of DE programmes, first to gain an in-depth insight into the characteristics of these variables from the perspective of students' experience, and second, to identify associations are there among three variables. The notion of structure covers many aspects this needs more granular level exploration. Although Moore's original conceptualisation of *dialogue* was limited to learner – teacher dialogue, Moore himself and many other researchers (e.g., Best & Condeicao, 2017; Kassandrinou et al., 2014; Friesen & Kuskis, 2003; Bolliger & Halupa, 2018) have either reviewed or investigated more types of interactions. Therefore, the notion of dialogue needs to take an expansive view of it in order to grasp the full spectrum of dialogue. The authors that Gorsky and Capsi's (2005; p.7) reviewed also "recommend that future research include interview and observational data". Therefore, taking Moore's TTD as a starting point, we were interested in carrying out a qualitative study to unpack these variables via following three questions:

ISBN 978-615-5511-25-7

- How do the distance learners perceive the *structure* of their course? How does their perception of different elements of the structure contribute to their engagement in the course?
- What are the distance learners' perception of the *dialogue* that is available on the course? How does this perception contribute to their engagement in the course?
- How do the distance learners perceive the *autonomy* available on their course? How does this perception contribute to their engagement in the course?

Research context and methods

This research was carried out on two distance post graduate programmes at Leicester University: International Education (a 2-year masters programme) and a Learning Technologies (an 8-month post graduate certificate programme). Our familiarity with these two courses was the main reason for this choice. The participants of the masters programme are located around the word (see Figure 1) while those on the PGC programme are mainly from the UK.

Figure 1. Locations of study (Masters programme, 2017 / 18 Academic year, n = 60)

After receiving ethics approval from the University (Ref: 18011) an invitation email was sent to 70 current students and four graduates of the masters programme, and 16 recent graduates of the post graduate certificate (PGC) programme. 16 students from the masters and two from the PGC programme volunteered for the research and they were interviewed (15 via Skype; 2 face to face, and 1 email). Participants from the Masters programme were in different stages of the programme. Interviews lasted between 40–60 minutes and were digitally recorded and transcribed for thematic analysis. Interview questions to explore the three variables were developed based on sources such as Moore (1993, 2013), Bolliger and Halupa (2018) and

ISBN 978-615-5511-25-7

Kassandrinou et al. (2014). The full interview schedule will be shared at the conference presentation.

Preliminary insights from data analysis

The analysis of interview data is presented according to three variables: *Structure*, *Dialogue*, and *Autonomy*. Illustrative quotes from interviews are used to highlight the themes presented in the analysis.

Structure / structural aspects of the programmes

The way in which our respondents reflected on the various structure-related aspects of the course can be summed up as: (a) the week-by-week division / arrangement of themes, (b) the structure in which material are presented in each week, (c) the approach to learning (pedagogy), (d) link between assessment, feedback and learning, (e) types of media and learning activities, and (f) links between course content and activities and professional interests. Due to the limitation of the space, the first 5 will be reviewed here.

All the interview participants were unanimous in saying that how the division of themes in each module and the weekly structure in which content and activities are presented have been helpful for their positive engagement in the course.

This prescribed nature of the course was helpful for the course participants who have

> *"very busy life"*

and not having

> *"too much time to deviate from required activities of the course"*

> *"Weekly sessions are clear in terms of what you need to achieve, and expectation were realistic and aligned well with the work – study balance."*

Views expressed by others include comments such as:

> *"I am in control of my learning. Each week built on the previous week"*

> *"if I didn't have a prescribed structure I would have done a binge study days and left for a month"*

> *"I will be floating around if not for this structure. It is not spoon feeding, but giving direction."*

The link between assessments, feedback and learning was another factor identified as contributing to their sense of engagement with the course. The variety of assessments on the two programmes (media-based assignments as formative assignments and written essays as summative assessments) have been engaging for them.

ISBN 978-615-5511-25-7

Participants also commented on the pedagogical approach that underpins their learning. On both courses that we have investigate, the presentation of content can be considered as promoting what Laurillard (2012) refers to as "acquisition-oriented learning". Leaning in both courses is primarily around reading text, watching videos, taking notes, and to a limited extent, engaging in collaborative activities (more on this under *Dialogue*). Our interview participants were in general happy with this type of learning. One participant commented that "That works for me. I like to gather information from range of sources. Good to go back to read good academic text". However, participants also pointed out the challenges of learning in this way, which will be discussed under the category *Dialogue*.

The course content in both programmes in each week consist of a short introductory video, text, further short videos to explain concepts, links to recommended reading activities, reflective activities for participants to carryout. This variety of media and learning activities has been a useful structural element for participants' positive engagement in the course. One participant commented that "I like reading but if I haven't got long it is good to sit and listen to something and watch a quick videos about it. … So having a range of approaches and material were".

Dialogue

As argued early in the paper, we wanted to take a broader view of the notion of *dialogue*, not only something that happens between the teacher and the student. The majority of participants felt that the dialogic element / dimension of the two programmes were minimum or limited and that to some extent this has an effect on their learning and study experience. Participants identified a range of reasons as well as the point in the course where they felt the dialogue is important. For one participant it was a time leading to assignments: "Often I have small questions, ideas … it would be nice to bounce ideas informally. That is when I notice the distance most. Often when I start an assignment, I am not confident of the direction I need to take. Sometimes it would be good to talk to someone informally about how the assignment is going". Another reason for wanting a dialogic relationship with others was related the underlying pedagogy of the course, i.e., self-study nature and acquisition-oriented learning. Some participants felt that often they have questions based on their reading, watching videos and learning activities and "the lack of opportunities to ask questions regarding the things that you read" is not a positive experience

Participants identified how they currently engage in a dialogue with others: (a) formal interactions with the tutor, (b) working with an assignment partner, (c) wiki pages, (d) blogs, (e) interaction with own professional communities. (f) weekly communications from the module leader, (g) voice-based assignments, and (h) virtual attendance at seminars conducted at the university. Due to the limitation of the space, the first 5 will be reviewed here.

All participants pointed out that their interaction with the tutor has been a positive aspect of the course. On our two programmes, students have a personal tutor with whom they can communicate via Skype, Facetime (or other online tools), email or phone. Students have used

ISBN 978-615-5511-25-7

their tutors to seek clarifications ("When I am not sure about something"), advice on literature ("struggling to find a books they might know about"), writing essays ("restructuring the essay to meet the academic writing level"), and receiving directions. However, participants also indicated that they wanted more instantaneous and frequent contacts with their tutors.

Participants also pointed out the positive experience of working with an assignment partner for their first assignment in which students on the Masters programme worked as a pair or a set of three to produce a collaborative piece of written work of 1,500–2,000 words. Each student would work with another student who is based in a different country or a different educational context. As the first assignment this can be a challenging task, dealing with technological issues, managing personal work, time differences, and different educational backgrounds. However, all the respondents, except two stressed that they have developed a positive dialogic relationship with their assignment partners. Comments such as the following highlight these positive experiences:

> *"It was very helpful for me to upskill myself … working along someone else and supporting and guiding was very helpful. She is now a close friend and I saw her during summer and I've now build that link and we are keeping in touch"*

> *"Collaboration worked very well. Even if we lived in opposite sides of the world, she lived Japan] and I live here [Nethrlands] … We have similar passion about special education. And comparison of east and the west."*

The participants also commented on the use of the Wiki on the Research Methods module in which students are expected to write wiki entries reflecting on their development of a small-scale research project over a period of 8–10 weeks. Participant thought that this more *formalised* approach to collaboration was

> *"very useful being able to see what topics others have chosen for their research, how they have formed research questions, …[to] consider other approaches …."*

> *"Even if I hadn't posted any yet, … reading others posting and I can improve my ideas…".*

The analysis of the use of Blogs (Figure 2) on the PGC programme revealed the social value in fostering dialogue and collaborative learning. These showed the students' voluntary use of blogs to form a learning community. For example, S1 received 11 comments from S2, and five of which S1 commented back on S2's comments. For one of the blog activities, students were required to conduct resource audit to design a course, S1 provided examples of technology enhanced learning activities that she has done in the past with uses of tools. S2 posted questions to seek for elaboration from S1 regarding the editing system for creating different learning activities and how to measure the impact of engagement among pageviews. S1

ISBN 978-615-5511-25-7

answered this question and elicited S2's interest in her course, in a later blog comments, S2 provided some formative feedback for possible improvement for her designed course. These blogs also show blogging have the potential to improve dialogic activity by allowing students to be exposed to alternative perspectives.

All the participants interviewed mentioned that they have regular interactions with own professional communities in which they can either discuss course related aspects and / or apply their learning into the professional practice. One participant mentioned that:

> *"We sit around a table and have a coffee and say oh I was reading this and share articles … and we share those ideas as a wider professional circle".*

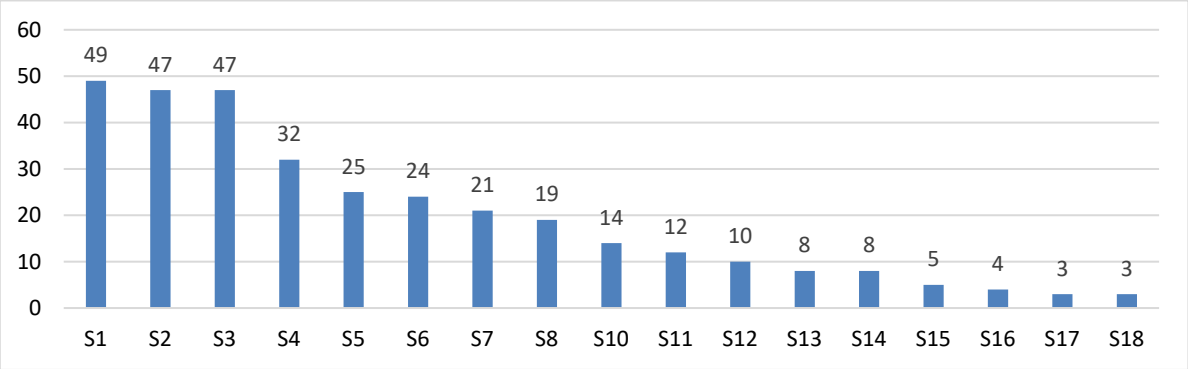


Figure 2. The number of blog entries created by students (n=18) over 8 months

Autonomy

Interviewee participants highlighted a number of ways they feel that they have autonomy in the course: (a) personalising the study timetable, (b) personalising the assignments, (c) tailoring learning to personal, professional and local contexts.

Although the course is structured as weekly work-packages the participants felt that they can personalise their own study timetable around their own work pattern. One participant highlighted this as follows:

> *"The whole module is there so I can do a forward plan. … . I put my own timetable scheduled in. I scheduled in when I would be able to carry out the tasks that were required. Here are my time to do the reading, the tasks and carry out the assignments. I like to send [the tutor] a time-line to say 'this is when I send you my first draft, second draft and this is when I like you to send me back the comments'. That was really good."*

Most participants pointed out that their assignments gave them a sense of autonomy in the course. The following quote summarises one participants experience with her assignment:

> *"The essay that I wrote was mine! Because I had to look for it [the topic]. I had to develop it, it was really hard to start with, try to find an essay question. I*

ISBN 978-615-5511-25-7

> *was like 'Hah, they haven't given me any topic! I had to think of it all for myself' but talking to few people in the school [and thinking for myself], I really enjoyed finishing that essay … I am really proud of this. I like where it has taken. I have given it to few people to read. They said 'oh, interesting'."*

Another participant pointed out that

> *"Although the learning itself is very structured in terms of topics, when it comes to assignments I feel that I have the autonomy. That I am in control."*

Participants also very positive about their ability to tailor their learning to personal, professional and local contexts. One participant mentioned that

> *"I like the sense of autonomy. That is because the course is supporting the job that I am doing. … to apply with my children in my class."*

Another participant stressed that she is able to carry out her studies according to where her "my passion lies". For another participant the course gives

> *"a choice of reading … and you can make this course what you want."*

Initial reflections and further work

We initiated this research with a view to gain an in-depth understanding of the three variables – structure, dialogue, and autonomy – that Moore has identified in 1972 as essential features of distance education. Our preliminary analysis of interview data from a small number of course participants from two post graduate distance learning programmes shows how students view their learning experience according to the three variables. These insights can be represented as an emerging model (Figure 3) of the constituent parts of each variable and their influence on one another.

ISBN 978-615-5511-25-7

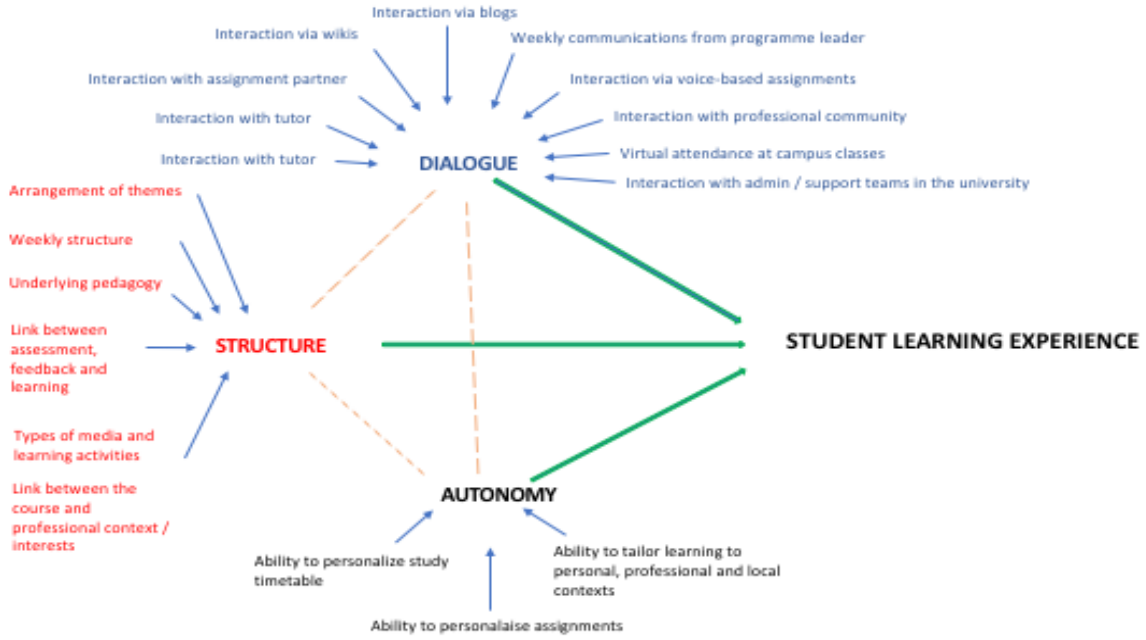


Figure 3. An emerging model depicting factors underlying learning experience at a distance

It is important to recognise that our sample was small and that the data were collected from only two post-graduate courses with particular approach to design and delivery of those course. Therefore, it is too early to make any generalisations based on this set of data. We plan to collect more data using two more courses in the near future while improving the qualitative instrument that we have used in this research. We hope that this will enable us to develop further insights into how we might improve the student learning experience by addressing each of the factor that contributes to *structure*, *dialogue* and *autonomy*.

References

1. Best, B., & Condeicao, S. C. O. (2017). Transactional Distance Dialogic Interactions and Student Satisfaction in a MultiInstitutional Blended Learning Environment. *European Journal of Open, Distance and E-Learning, 20*(1), 138-152.
2. Bolliger, D. U., & Halupa, C. (2018). Online student perceptions of engagement, transactional distance, and outcomes. *Distance Education, 39*(3), 299-316.
3. Friesen, N., & Kuskis, A. (2013). Modes of Interaction. In M.G. Moore (Ed.), *Handbook of Distance Education* (3rd ed.) (Chapter 22., pp. 351-371). London: Routledge.
4. Gorsky, P., & Caspi, A. (2005). A Critical Analysis of Transactional Distance Theory. *The Quarterly Review of Distance Education, 6*(1), 1-11.
5. Kassandrinou, A., Angelaki, C., & Mavroidis, I. (2014). Transactional Distance Among Open University Students: How does it affect the learning process. *European Journal of Open, Distance and E-Learning, 17*(1), 26-42.

ISBN 978-615-5511-25-7

6. Laurillard, D. (2013). *Teaching as a Design Science: Building Pedagogical Patterns for Learning and Technology.* London: Routledge.
7. Moore, M. G. (1993). Theory of Transactional Distance. In D. Keegan (Ed.), *Theoretical principles of distance education* (3rd ed.) (Chapter 2., pp. 22-38). London: Routledge.
8. Moore, M. G. (2013). The Theory of Transactional Distance. In M.G. Moore (Ed.), *Handbook of Distance Education* (3rd ed.) (Chapter 5., pp. 66-85). London: Routledge.

ISBN 978-615-5511-25-7

Towards Personalized Guidance and Support for Learning
Proceedings of the 10th European Distance and E-Learning Network Research Workshop, 2018
Barcelona, 24-26 October, 2018
ISBN 978-615-5511-25-7

LEARNING EXPLAINED: A SCHEMA-BUILDING SCAFFOLDING FRAMEWORK TO MAKE SENSE OF PERSONALISED GUIDANCE AND SUPPORT FOR LEARNING

Ignatius G.P. Gous, University of South Africa, South Africa

Abstract

The results of credible research on learning do not readily make it to the classroom; neither does it easily translate into useable strategies to guide and support learning. Solid, reputable and valid research on learning is often inaccessible to practitioners, while simplified research results are prone to become what is referred to as "Neuromyths". To assist in the quest for personalized guidance and support for learning, the article is based on Schema Theory. A schema is a *mental framework* humans use to represent and *organise remembered information*. *Schema Theory* demonstrates effective learning as knowledge construction by building and expanding mental schemata, rather than merely information transmission.

The article starts with the mystery in my story – an auto-ethnographical reflection on my personal journey with learning. Learning is not something abstract – it is something that develops over time, thereby creating mental schemas. That is what the narrative highlights. This is followed by discussing pitfalls to learning, namely pervasive Neuromyths. Effective learning is then brought into the picture – it can be developed, based on reputable research. Therefore, an overview of some studies on learning is given. In doing this, there is the realization that this field is so vast and so complicated, that it is easy to drown or become lost in the difficult-to-understand details. Therefore, I developed a logical scaffolding framework called The Golden Spiral of Life-long Learning, which has two major characteristics. The first characteristic is that it is emulating the learning journey, namely the way learning actually takes place. As such, even primary school children can understand and follow it. The second characteristic is that it is scalable, in the sense that it is robust enough that even specialists in the field of the scholarship of learning can use it as a scaffolding framework to organize their knowledge of the field – which in itself is a characteristic of effective learning. To show that this is the case, the framework is used to make sense of postings from two web pages devoted to promoting effective learning, namely MindShift and TeachThought.com, each with a following of more than 800 000 subscribers. The postings are based on, and refers to reputable research, but the postings have been popularised for the sake of understanding. The conclusion is that structured and guided mental schema-building is an indispensable strategy for personalised guidance and support of learning, not only by teachers, but also for students to whom this strategy should be modelled and taught.

Introduction

The results of credible research on learning do not readily make it to the classroom, neither does it easily translate into useable strategies to guide and support learning (Tokuhama-Espinosa, 2008; 2014). Neuromyths, on the other hand, spread like wildfire, and once in force, are very hard to eradicate (Tardif, Doudin, & Meylan, 2015; Dekker, Lee, Howard-Jones, & Jolles, 2012; Dündar & Gündüz, 2016). The challenge is: how can we support educators to make sense of research, empower them to identify questionable claims and problematic research claims and findings, and enable them to translate credible research into effective classroom practice?

To meet this challenge, a scaffolding framework was developed, emulating the spiralling learning trajectory, with aspects of the learning process placed along the learning pathway.

The framework was then tested by using it to explain learning to various audiences, ranging from university lecturers and students to schoolteachers and –learners, even as young as 10-year old Grade 4 learners. The framework was found to be able to guide and support all of the audiences to understand the process of learning. The framework was also found to be scalable, in the sense that on the one hand it was simple enough to help young children how to learn, but at the same time, it was robust enough to help specialists in the field to organize research results in a coherent and interconnected set of schemas and frameworks.

In this article, the author reflects on his own learning trajectory as an example in case of how learning takes place in real life, as an illustration of and precursor to the theoretical discussion of the Science of Learning.

A short discussion of pervasive pseudo-science Neuromyths is followed by mentioning reputable learning theories.

The challenge to (mostly overburdened) educators is to be able to keep abreast of developments in this vast field. For this reason, based on the learning theory of mental schema-building, a scaffolding framework is proposed to help educators make sense of the results from the vast field of the learning sciences.

To test the applicability thereof, two websites were chosen, to which more than a million Facebook users subscribed. These are the kind of sources educators would choose to use – they are readily available as part of the social media platforms they access every day. The most recent 50 postings of each were accessed, and each were assessed as to which of the six plus one rubrics along the Golden Spiral they could be assigned to, thereby creating sub-schemas.

The conclusion is that structured and guided schema-building is an indispensable strategy for personalised guidance and support of learning, not only for teachers, but also for students to whom this strategy should be modelled and taught.

ISBN 978-615-5511-25-7

The Mystery in Mystory … why did it not work?

The typical trial-and-error student

If I have to share my Life Story Schema (Lewis, 2011; Bluck & Habermas, 2000), I will have to admit that I was the typical student – given content to learn, but never taught how to learn and master the prescribed content. How to do it, I had to figure out myself. So I did the usual thing copied from my peers: I read and reread the material I had to study and memorise. I underlined and highlighted. I crammed right through the night before a test. I studied in different locations – sometimes at my table, sometimes outside in the garden, sometimes on my bed. I studied from summaries – sometimes my own, sometimes ones I got from fellow students.

With this arsenal of strategies, I was a slightly above average performer at school, but not in the top performer bracket. When I moved to university in another city from where I matriculated, I felt I could make a clean start where the lecturers had no preconceived idea of my performance bracket. I also started with a challenging degree, which included foreign languages as well as courses with masses of information. I felt I owed it to myself not to fail and fall behind. Apart from being highly motivated to turn a new page, two more things happened. I befriended a fellow student who had scored straight A's at school. I also attended a study method course focused on MindMaps and time management.

Accountability partner

Unlike me, my friend was a highly organised person who studied diligently and according to a planned schedule. He became my accountability partner, and what developed was a *pacing relationship* where we regularly checked how far the other one had progressed. I usually lagged behind, but still it helped me to stay more on track and time than before. It helped me to such an extent that I also performed well, and I passed my first degree (Bachelor of Arts) with distinction.

Learning by teaching

This lead to a specific experience I remember well to this day. During my second degree (Bachelor of Divinity), we had to write a test on Hermeneutics, for which a textbook written in German was prescribed. Many of the students could not read German and therefore had to rely on summaries. I had a basic reading knowledge of German, but this book proved to be very challenging. The evening before the test, a fellow student who stayed in the same student residence as I did, came to me for help. I explained to him my understanding of the work. A while after he left, another student knocked on my door, saying he heard I explained the work to his friend, and asked that I explain it to him too. I did, and he went his way. Then a third, and later a fourth student came to me, asking the same. At this stage, I was a bit irritated, because I felt they infringed on my study time, but I also realised that every time I explained it to them, I was able to talk about the work more fluently and with more confidence. In between each visit, I checked on the parts I was not so sure about and questions that were

ISBN 978-615-5511-25-7

asked that I could not readily answer. The next day we all wrote the test, and when the marks came out some time later, all the fellow students I helped passed the test with flying colours. My performance in the test was one of the highest marks I ever obtained. Teaching, I realised, was a powerful learning strategy.

Learning how to learn – by trial and error

The initial course I attended in my first year fuelled a life-long interest in how to study effectively, and I read every book and source about learning I could lay my hands on. This lead to peculiar actions and habits. I made huge and colourful MindMaps on the backs of old calendars, computer paper and flipchart papers – which lead to amused looks from fellow students when I took it out to revise in class – also because I needed the space of about four students to do revision. I always had something on my ears when studying – from industrial noise cancelling earphones to create total silence, to earphones for listening to anything from white noise to baroque music with 40 to 60 beats per minute, or music without any beat at all. I numbered everything I had to learn and tried to memorise it by using anything from number-sound and number-shape methods, including using the Major System. When I ran out of numbers, I tried to drape them in colours or states like fire, ice or water (Worthen & Hunt, 2011; Mostafa & El Midany, 2017; Aydin & Sunbul, 2012).

Metacognition

I passed all of the tests and exams I wrote. However, most of these strategies did not actually make the learning process and experience faster, more efficient or easier. To the contrary, they actually made it more cumbersome and even awkward. I felt I merely did all the wrong things very well.

I had to take stock, stand back, weigh and evaluate all I did. What worked, and why? What did not work, and why not?

What worked well?

What stayed with me were two strategies. The first one was to start by learning a table of contents of a book and all the headings of a chapter by heart, and then adding detailed information. In this way I had a schema that could organize new information, and that could be elaborated and added to. The second strategy is to teach what I have learnt – be it to a real person, or just by talking out loud (which added to the perception that I was an "odd" learner). Teaching showed me what I knew well enough to talk about coherently, and which aspects I did not know well enough and needed to revisit (Gous, 2015).

What I wondered about were all the strategies that did not work well, and especially why. Did I use them incorrectly? Did I expect too much of them? Were they really effective? All along, I had this nagging feeling that many of the strategies were not geared for the study of serious and difficult academic work. They might be good for remembering a grocery list, but not the elaborate content of a course that may run over two or three years.

ISBN 978-615-5511-25-7

It was then that I came across the term *Neuromyths*.

Seduced by Pervasive of Neuromyths

Neuromyths are remarkably persistent beliefs about the brain and the mind which relate to learning and education (Ansari, Coch, & de Smedt, 2011; Dekker et al., 2012; Ferrero, Garaizar, & Vadillo, 2016; Geake, 2008; Gleichgerrcht, Lira Luttges, Salvarezza, & Campos, 2015; Purdy & Morrison, 2009; Tardif et al., 2015; Tokuhama-Espinosa, 2011). Many of the beliefs originated in reputable research findings, but were used beyond their original intention, transmitted in a diluted form, or incorrectly applied. Still, they stick.

The neuromyths had an influence on my self-perception, telling me I use only 10% of my brain. I saw myself as a right-brained person who looked creatively at the big picture, and I neglected the details of what I was studying.

The neuromyths also had an influence on my learning strategies, because I tried to learn according to my learning style, which is supposed to be visual. I neglected listening and doing, I tried to put all my summaries in visual format, which took an inordinate amount of time, and I seldom had time to actually memorize my MindMap summaries. To my dismay I realized I could not remember the pictures I had drawn, even though visual memories were supposed to be almost infallible (Kampwirth & Bates, 1980; Doyle & Rutherford, 1984; Curry, 1990; Snider, 1990; Stahl, 1999; Doyle, 2011; Gutierrez & Rogoff, 2003; Dembo & Howard, 2007; Purdy, 2008; de Bruyckere, Kirschner, & Hulshof, 2015; An & Carr, 2017).

The baroque music also did not have a major influence. The only lasting influence was that it actually spoiled my enjoyment of the music, and to this day when I hear some of those pieces, it reminds me of studying under pressure, more than remembering what I tried to remember about the work.

Neuromyths are much like rumours. They stem from a (seemingly or real) credible source. It is well known that every magazine with a picture of a brain on the cover sells well. They simplify a believable truth to manageable proportions. They are repeated enough times that they are still believed even when questioned or disproved. It took personal experience that they do not work to force me to reconsider them, and to think about them metacognitively.

If there are many wrong, outdated or skewed views about learning available that people still believe, where do we get credible guidance?

The many faces of learning – and the credible Theories that explain them

Learning is a natural activity, and people do it from birth onwards to survive. As such, it is seldom explicitly taught – who teaches people to breathe? Therefore, people do not necessarily reflect on their own learning. It just "happens". When it works more or less well, people do not examine it critically. However, since learning became formalised, learning theories developed. Thinking about learning developed into disciplines, namely the Sciences of

ISBN 978-615-5511-25-7

Learning (SoL), or the Scholarship of Teaching and Learning (SoTL) (Mayer & Mayer, 2014; Mayer, 2008; Meltzoff et al., 2009).

Learning is not a one-size-fits-all endeavour, but rather a complex and multi-faceted human activity, an interplay between the learning individual, the to-be-learned material, and the relevant and available sets of strategies.

Since the beginning of time people thought about it, leading to contrasting views on it.

Tokuhama-Espinosa discusses (2016) "Theories of how humans learn" in a March 3, 2016 lecture (Neuroscience of Learning: An introduction to Mind, Brain, Health, and Education – PSYCE-1609) prepared for students at Harvard. In summarised form, these are the learning theories a researcher or practitioner needs to know about. The mere mentioning of the list is to indicate the extent and intricateness of the field, which makes it difficult for a practitioner to navigate the terrain with more success and joy. (See also Zhou & Brown, 2017; Mowrer & Klein, 2001).

Humanist theories:

- Emotional intelligence,
- Experiential learning,
- Maslow's hierarchy of needs,
- Positive psychology: Flow and grit,
- Self-determination theory.

Behaviourist theories:

- Classical conditioning (Pavlov),
- Operant conditioning (Skinner),
- Social learning theory (Bandura).

Cognitivist theories:

- Information processing theory,
- Cognitive load theory,
- Expertise theory,
- Gestalt theory,
- Theory of mind.

Connectivist theories:

- Anchored instruction,
- Cognitive dissonance,
- Communities of practice,
- Situated learning,
- Social development theory,

ISBN 978-615-5511-25-7

- Problem-based learning.

Design-based theories:

- ADDIE (Analysis; Design; Development: Implementation; Evaluation) model of instructional design,
- Elaboration theory (scaffolded instruction),
- Learner-centred design,
- Multimodality,
- Digital citizenship,
- Gaming.

21st century skills:

- Soft skills,
  - Collaboration,
  - Communication,
  - Caring,
  - Critical thinking,
  - Culturally sensitive,
- Technology,
- Life-long learning.

Constructivist theories:

- John Dewey,
- Maria Montessori,
- Wladyslaw Strzeminski,
- Jean Piaget,
- Lev Vygotsky,
- Heinz von Foerster,
- George Kelly,
- Jerome Bruner,
- Herbert Simon,
- Paul Watzlawick,
- Ernst von Glaserfeld,
- Edgar Morin,
- Humberto Maturana.

New theories:

- Plasticity, gene and environment interaction,
- Neuroconstructivism,
- Neural networks,
- Five pillars: Symbols, patterns, order, categories, relations.

ISBN 978-615-5511-25-7

Overworked and Overwhelmed – No ways I can keep up with all of this!

From this, it is clear that the scholarship of learning is a vast and complex field. It is difficult for specialists and practitioners alike to keep abreast of developments in the field and to make sense of new research findings that become available every day. Research on a focused topic is presented, and practitioners need to try to assess it, often without knowing from which of the various research perspectives it stems. No wonder it is a difficult task to build coherent mental knowledge schemas, and to distinguish between good and bad research findings.

One way to address this difficulty is to use the learning strategy called mental schema building. It has links to Gestalt theory as well as information processing theory, and is based on Constructivism and Neuro-constructivism. Knowledge coagulates in mental schemas, or sense-making units of knowledge. At least three general classes of schemas can be identified (Derry, 1996; pp.167-169), namely

- Memory objects (phenomenological primitives, integrated objects and object families), which is about basic and complex knowledge structures about phenomena;
- Mental models, which is about constructing, testing and adjusting mental representations, and therefore understanding complex problems and situations; and
- Cognitive fields, a distributed pattern of memory activation that makes certain memory objects available for use.

Broadly summarised, schemas are about knowledge, understanding and the use thereof. A mental schema is a framework representing some aspect of the world that has been built up over time and after exposure to inputs from people, the environment, ideas and experiences. As such, it becomes a system that helps one to organise and perceive new information. New knowledge adds to, adapts or changes the schema (see also Arbib, 1992; Bluck & Habermas, 2000; Gosh & Gilboa, 2014, McClelland, 2013; McVee, Dunsmore, & Gavelek, 2005; Plant & Stanton, 2013; Rumelhart, 1984; Rumelhart, 1991; Ortony & Rumelhart, 1977; Rumelhart, 2017; Xie, 2017).

What follows, is a schema building scaffolding framework, intended to make it easy for educators and learners to make sense of the vast discipline of the learning sciences.

The Golden Spiral for Life-Long Learning Scaffolding framework

In practical terms, learning can be described as a journey or trajectory through an area, with characteristic and recurring features and milestones along the way. People learn for a reason, they plan the process, they perform learning tasks, they make mistakes and rectify them, they ask for help and assistance, they assess their progress, and when they reach their goal, they do it all over again. It is also to reflect on the process, to see what worked well and what not, and especially why, in order to improve continuously.

The learning trajectory is depicted metaphorically as a Fibonacci spiral. The spiral portrays learning as a revisiting endeavour. The Fibonacci aspect depicts the fact that individual

ISBN 978-615-5511-25-7

aspects are useful on their own, but when used in conjunction with one another, it has an exponential effect, just as the addition of consecutive numbers leads to the widening of the spiral (Horadam, 1961).

There are six milestones along this trajectory, with a seventh meta-milestone. These six plus one aspects are present in various ways in all acts of learning. They are presented in a linear fashion, but can be used in any order, repeated or even be concurrent.

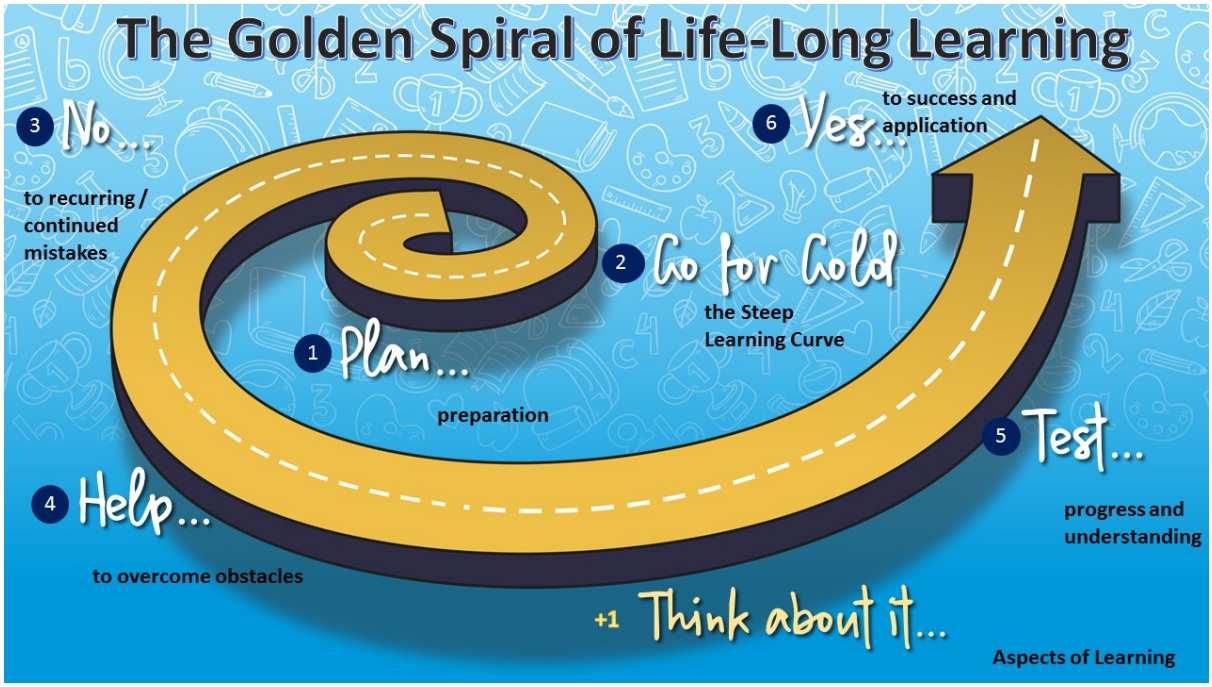


Figure 1.

Yes: the goal

The last aspect is actually the first aspect, and is about why a person studies. This can be part of a long-term life goal, translated into a medium term qualification goal, and made concrete in a short-term study session goal. Although the goal is at the end of the spiral, it is in actual fact the starting point, as in the theory of backward planning versus forward planning (McTighe & Thomas, 2003; Wiggens et al., 2005).

Plan: How to reach for the goal, how to plan the learning activity.

When the goal is clear, action steps to reach it are necessary. This is once again divided into long, medium and short-term action steps. It is also about focus and being available to learn.

Go: How to perform the learning tasks

This aspect is how to memorise and understand data, information and knowledge, and how to master necessary skills. The goal here is to be aware of many learning strategies, and to choose those geared for the specific learning task at hand.

ISBN 978-615-5511-25-7

No: How to manage mistakes

Mistakes are always part of learning. It is important to expect them, and to learn from them – what kind of mistake it was, and how to correct and, in future, avoid them.

Help: How, where and when to seek necessary help and support

Help needs to be sought after a person attempted a task. Only then can a person know what kind of help is needed and from whom it can be requested, such as from sources, experts or peers.

Test: How to assess progress

Assessment of a person's level of understanding needs to be done all along the way, and not only when writing tests and exams.

Yes: Arriving for the sake of departing again

Arrival at a pre-set goal gives feelings of accomplishment. A short-term goal fits into medium and long-term goals, and therefore the arrival at the goalpost is immediately the departure to the next part of the journey.

Plus one (metacognition): Thinking about it – reflecting on and understanding the process and the constituent parts

Understanding each of these aspects as well as how they fit into a coherent schema is important for the sentient use thereof.

These six plus one aspects are broad enough to group diverse rubrics under each of them, but at the same time specific enough to create useable strategies in real life learning situations.

Scaling the Scaffold, Testing the Framework: Mindshift / TeachThought Websites

The question is whether this scaffolding framework will actually help educational practitioners and researchers to get a grip on the complex field of the scholarship of learning. For this reason, I chose two websites with a substantial following where people choose to get updates on postings. Both sites can be followed or "liked" on Facebook, which means followers get automatic updates of postings on their Facebook walls.

The first is MindShift, with a following of 812606. It describes itself as "a podcast about the future of learning". It is also available on http://mindshift.kqed.org, Google Play, NPR One, and Stitcher.

The second is TeachThought, with the goal being "an organization dedicated to innovating education through the growth of outstanding teachers", and with the mission "to support teachers as they grow into innovative educators".

ISBN 978-615-5511-25-7

The methodology was to take the last 25 postings of each of the websites on a given date (September 25, 2018), give a short summary of what the posting was all about, and then to see if and where it fits under the 6 + 1 rubrics along the Golden Spiral of Life-Long Learning.

The ratings of the postings were done by a masters' student of educational psychology, who also acts as an assistant teacher in a South African school. Afterwards, the author of the paper did the same to see if his assessment coincides with that of the first evaluator.

Table 1: The articles and their categorization (MindShift)

No.	Title	Summary	Student	Author	Differ
1	Overcoming childhood trauma: How parents and schools work to stop the cycle	This article acknowledges the learner's challenges and recognises school attendance as willingness to learn and attitude of ownership of their life despite their challenges. Parent-child interaction therapy serves as a method of improving communication between child and parent and helps with management of tantrums and aggression.	Help	Help	
2	How tips via text messages help parents and preschool learners learn	Technology-generated reminders of simple tips on how parents can engage with pre-schoolers by means of simple learning activities they can do together. Researchers are exploring how a simple text-based nudge to parents could improve their kids' academic performance by making engagement easier and even habitual for parents.	Help	Help	
3	How to use YouTube video essays in the classroom	Motivation on why videos should be used in the classroom - capture attention of students and simplify complex topics.	Learning curve	Learning curve	
4	Voice of witness: Bring the power of oral history to your classroom	The exposure of students to different stories, helping them see that they are participants in history. Helping those with a silent voice to be heard, by telling their stories.	Learning curve	Learning curve	
5	The five types of mentors you need in your life	How to develop deep connections with mentors, teaching both the mentor and the mentee.	To success and application	Help	*
6	Tech tips: Make the most out of your coaching experience	The importance of a teacher having a coach that provides them with feedback and support. Steps to build such a relationship.	Metacognition	Metacognition	
7	Working in a group might be the best way to help kids meet individual goals	Learning is a social activity and learners must be involved in each other's learning process thus the argument for group work. Group learning personalizes the work.	Plan/ the learning curve	Learning curve / Help	*
8	How parents can help improve the quality of a teen's sleep	Importance of sleep in the adolescent developmental phase and of reducing the use of electronic devices. A call for parents to be active.	The learning curve	Planning / Metacognition	*
9	How cross-cultural dialog builds critical thinking and dialogue	Ways teachers can encourage dialogue among students to share different perspectives.	Help	Help	
10	How advisers connect via tech to help low income students apply to college	A free virtual advisor taking the pressure of learners to apply for college education. A virtual career guidance helper assisting: Step by step	Help/ Plan	Help / Plan	
11	Learning mindfulness centred on kindness towards oneself and others	Mindfulness empowers and excites students to grow personally and academically. Mindfulness practised for the classroom.	Learning curve	Plan	*
12	Improving academics: Why school climate matters	A positive school climate encourage teachers to be their best and contributes to positive job experience resulting in learners enjoying coming to school.	Think about it	Plan / Metacognition	
13	Three tools for improving critical thinking and problem solving skills	Integrative thinking can build critical thinking at a young age. Examples of integrative thinking tools for the classroom.	Learning curve	Learning curve	
14	Even when research	The importance of a quality preschool is stressed.	Metacognition	Metacognition	

ISBN 978-615-5511-25-7

	supports changing traditional teaching, parents make it hard	Interactive learning is of utmost importance, there need to be hands-on activities (experimental training).			
15	Three things top performing students know that their peers miss	Learners must study in a way that requires more than just memorizing material. The importance of study schedules is stressed.	Learning curve	Planning / Learning curve	*
16	How to develop mindsets for compassion and caring in students	A mindset of resilience needs to be fostered in learners. Strategies on how teachers can be more intentional in their classrooms to build compassion and care into students - resulting in resilience	Metacognition / Help	Metacognition / Help	
17	What do we lose by measuring "average" in education	An argument against generalization as individual's backgrounds and circumstances differ. Equal fit approach to a situation, rather than average.	Learning curve	Metacognition	*
18	Could this digital math tool change instruction for the better	A program that harnesses the social nature of online interactions into meaningful math inquiry. Learning is social and students are encouraged to think beyond equations, processes are made visible and students get written feedback.	Help	Help	
19	Bay area (USA) teens on the books that change their world	Short book reviews from learners' perspective on popular modern books that learners resonate with today.	Metacognition	Metacognition	
20	Confessions of a former teacher	A teacher sharing her regard for education. She is of opinion that the best way to work with students is to work with them directly. A reflective approach to her experience as a teacher.	Metacognition	Metacognition	
21	A learning experience is different in a school that assigns laptops, a survey finds	This study reflects that technology increases student engagement with the learning material and a higher motivation to learn. An approach where technology is used as a tool to increase peer-to-peer interaction.	Learning curve	Learning curve	
22	7 strategies to keep your phone from taking over your life	Bit size information keeps our brain addicted to our smartphones. The human relationship with their smartphones are explored with 7 recommended changes in behaviour.	Help	Plan	*
23	How to talk to young people about the Kavanaugh story	The importance of educating young people on sexual violation is stressed and tips on how to do so are elaborated on.	Metacognition	Metacognition	
24	How to support your kid at school without being a helicopter parent	A call for parents to build resilience in their children by introducing four skills to instil in children.	Help	Metacognition / Help	
25	Forget talent: Why practise is key to most prodigies' success	An argument between hard work vs natural talent. This article suggests that practise leads to the development of natural talent.	Learning curve	Learning curve	
26	Tips and tricks to keep kids on track during genius hour	The article talks about how to help children solve problems, by breaking them down. Independence in the learning process is stressed and learners need to reflect on their learning.	Help	Metacognition	*
27	Another advantage of wealthy students	An explanation on the academic performance of students, the focus is on the advantages of the high economic class and context.	Metacognition	Metacognition	
28	Why schools are banning yoga	The article focuses on the importance of yoga and mindfulness and stress, the importance that children need to learn to divorce their negative thoughts and emotions. The clash between eastern religion and western science is a golden thread.	Learning curve	Metacognition / Plan	*
29	Teachers strategies for pronouncing and remembering students names correctly	The effect on names are discussed. It influenced self-esteem, self-concept, self-worth etc. Tips on how to handle mispronunciation.	Learning curve	Metacognition	*
30	How to help teenagers embrace stress	A psychological perspective on the effects of stress on the brain and behaviour.	Help/ Learning curve	Help/ Learning curve	
31	The curse of America's illogical school day schedule	Comments on the school day. Suggestions made on how to make school more enjoyable for students and teachers. The benefits on why school should start later and go for longer are stated.	Metacognition	Metacognition	
32	Kids are starting a revolution to get	An article on what science says about the effect of technology on parenting. The effect on child behaviour	Learning curve	Metacognition	*

ISBN 978-615-5511-25-7

	their parents to put down their phones	is elaborated on.		
33	Feedback tips on saving time and improving student writing	Factors that influence students' responsiveness on comments are discussed. Guidelines for constructive feedback are given.	Learning curve	Learning curve
34	Why group work could be the key to English learner success	Practical tips on teaching English to students and the importance of where students are placed in the classroom and with who they are paired is elaborated on.	Help	Help
35	What writing Wikipedia entries can teach students about digital literacy	According to this article, Wikipedia makes information more visible to students. It seems as if educators are among those loading information onto this platform	Metacognition	Metacognition
36	School year screen time rules from a teacher	This article is part of Common Sense Media's Parent Voices series, which provides a platform for opinions about parenting in the digital age. All ideas expressed are the writer's own.	Metacognition	Metacognition
37	Does too much credit recovery lead to inflated graduation rates?	There is questioning about how many students really deserve diplomas due to the cutting of credits. Graphical statistics indicate the credits. Recommendations are made for this worrying issue.	Test	Test
38	The coucher program we really need is not for schools - its for after school	The urgency for after school funding are emphasised, parents struggle to afford school fees and cannot afford after school care. The effect on the child's wellbeing is stated. Child supervision is of utmost importance.	Metacognition	Metacognition
39	10 jobs that should be safe from automation	Robots are taking over the workforce by force. The spread of artificial intelligence does not only automate the rote parts of our jobs, but encourages humans to take on more complex tasks.	Goal planning	Goal planning
40	Research based strategies to help children develop self-control	The importance of delayed gratification is stressed and focus is placed on "the marshmallow experiment" that teaches children self-control. The researcher speaks about the importance of trust in a relationship where delay of gratification is initiated.	Plan	Plan
41	Childhood trauma and its lifelong health effects more prevalent among minorities	People with low-income and educational attainment, people of colour and people who identified as gay, lesbian or bisexual had a significantly higher chance of having experienced adversity in childhood. The psychological effect of these traumas are discussed.	Help	Help
42	How do you know when a teaching strategy is most effective	A model that proposes why different learning strategies might be more effective at different stages of the learning cycle. The overall theme is that the "purpose of schooling is to equip students with learning strategies, or the skills of learning how to learn".	The learning curve	The learning curve
43	Why unlearning old habits is an essential step for innovation	The importance of unlearning certain habits is emphasised as well as a framework for implementing unlearning. If something needs to be unlearned, Biller's three frameworks for implementing unlearning are introduced: changing mindsets, changing habits and changing organizations.	The learning curve	The learning curve
44	As one Nashville group quietly re-segregates a group of parents pushes back	Parents are pushing to bring change in Nashville, comments from parents are captured and insights are shared.	Metacognition	Metacognition
45	Throw your children's art away	A call for parents to let go of nostalgic memories. The value of child art is discussed and the feelings around letting go of their pictures.	Metacognition	Metacognition
46	Reading responses that engage the real student	When teaching contextual analysis, it is more effective to use reading responses, rather than comprehension questions. Four rules to writing reading responses are shared.	Help	Help
47	How reading aloud to therapy dogs helps struggling kids	The use of a therapy dog that teaches children empathy, compassion and a deeper love for literacy. The therapy dog takes on the attention and helps learners feel less self-conscious and makes the child more confident and open to learning and their spirits are lifted.	Learning curve	Learning curve
48	Why teachers should help students learn effective study strategies	Dunlosky was looking for strategies that are broadly applicable and do not just aid memorization; he wanted to find the approaches that deepen understanding and help students transfer learning to new situations. A few	Help/ The learning curve	Help/ The learning curve

ISBN 978-615-5511-25-7

		practices are mentioned and discussed in detail.			
49	Forest preschools let kids run free, but can they change to reach diverse families?	Arguments that children thrive outdoors and while playing outdoors they are developing independence, resilience, and other valuable social-emotional skills. A tested model in Colorado.	The learning curve	The learning curve	
50	How can we teach math to encourage 'patient problem solving'?	Inquiry-based teaching, insight is shared that we need to build on students' current maths experiences and make it part of everyday life.	The learning curve	The learning curve	
					11/50 22%

Table 2: TeachThought Site

No.	Title	Summary	Student	Author	Differ
1	What is Bloom's Taxonomy? A definition for teachers	The hierarchical ordering of cognitive skills that help teachers teach and students learn. The different levels of Bloom's Taxonomy explained in a useful way.	Learning curve	Learning curve	
2	What do students think of your class	The importance of classroom identity is emphasised and lessons on how to establish a classroom identity is shared.	Help	Help	
3	The diagram of 21st century Pedagogy	The capturing of several core components of modern learning: Metacognition (reflection), critical thinking, technology, and problem and project-based learning.	Learning curve	Learning curve	
4	What is genius hour?	An approach where students are guided by their own interest, background knowledge and curiosity to learn. A process where students personalize their learning process. 3 Rules to this approach.	Learning curve	Learning curve	
5	Education 3.0 where students create their own learning experiences	The importance is stressed that learners are the creators of their own learning experience and the "curriculum" become the network, the access, and the endless modelling (good and bad) that these physical and digital networks provide.	Learning curve	Learning curve	
6	6 domains of cognition: The TeachThought taxonomy	A linear form of taxonomy simplified for the classroom. 36 rules to assist students with that battle with complexity.	Help	Help	
7	Volunteering in my wife's classroom opened my eyes	A collection of a teacher's reflections on the dark stories of the experiences of the learners in her class.	Metacognition	Metacognition	
8	30 storytelling tips for teachers: How to capture your student's attention	The importance and place of storytelling in learning was captured and tips are shared.	Help	Help	
9	8 strategies to make learning visual in your classroom	It is important to have different learning styles and as visual learning is one strategy its need and use is elaborated on. 8 practical strategies are shared.	Learning curve	Learning curve	
10	The most important thing a teacher should know	A brief explanation of the different ways the brain learns are stated and educators are encouraged to teach according to the way the brain learns, thus they need to adapt their teaching techniques to the material being taught.	Learning curve	Learning curve	
11	Wendal Berry and the loss on the University	An argument whether theory or thought should be taught. The context of education inspires what needs to be taught.	Metacognition	Metacognition	
12	25 of the most misunderstood ideas in education	It is mentioned that the education sector suffers from external pressure, but the internal structure is what drives it. The internal structures are determined by external forces sure as policy and government…this article aims to rectify certain misunderstandings about the internal education system.	Metacognition	Metacognition	
13	20 observable characteristics of effective teaching	A list of 20 measurable and observable characteristics of effective teaching - practical for teacher reflection.	Metacognition	Metacognition	
14	How to make friends: 10 teambuilding games for students	Graphical explanation and display of games that may contribute to a friendly classroom.	Help	Learning curve	*
15	20 collaborative learning tips and strategies for teachers	An argument that groups experimental learning or social learning deepens the taught content in the long term memory. Group formation is delegated into practical steps.	Help	Help	

ISBN 978-615-5511-25-7

16	How to add materials into an assignment in Google Classroom	Practical step by step break down of 'how to add materials into an assignment in Google Classroom' with digital presentations.	Help	Help	
17	Why being wrong is actually a good thing	The importance to see mistakes as opportunities to learn are stated and the reader is urged to see them as feedback loops	No	No	
18	How to help students find more time to read	Practical strategies to foster a reading to read mind set in the classroom.	Help	Help	
19	15 interesting ways to start class tomorrow	Way to set a new tone to your classroom.	Learning curve	Learning curve	
20	5 ideal traits of a project-based teacher	5 traits are shared that help teachers reach the goals of projects.	Help	Help	
21	6 strategies for getting to know your students	Strategies to help teachers lay strong foundations for their teaching relationship with their students. Strategies are shared.	Learning curve	Metacognition	*
22	12 questions to ask your students on the first day of school	A list of questions that may help teachers nourish their relationship with their students.	Learning curve	Metacognition	*
23	10 reasons teachers need a professional learning network	A list of 10 reasons teachers need a professional learning network. The importance of such a network was made clear.	Learning curve	Metacognition	*
24	12 myths about project-based learning	A graphical presentation about the myths and the importance of project based learning is stated as a progressive learning model that can grow teachers –and thus grow the minds and potential of students.	Learning curve	Learning curve	*
25	6 strategies for creating a inquiry driven classroom: Modern education	Teachers are encouraged to allow students to be curious and teachers are urged to be more flexible with their lesson plans. Strategies are shared to practically assist teachers to be open to students yet keeping to the lesson plan.	Learning curve	Learning curve	
26	A letter grade is not A letter grade: Why we should stop averaging scores	10 reasons why scores should not be averaged. The importance of accurate communication is emphasised.	Metacognition	Metacognition	
27	How I use video for assessment in my classroom	Assessment of learning is not as important as assessment for learning. Videos are used to captivate students' attention in a way that they resonate with the content and enjoy learning. Tips on how a teacher uses video in the classroom are shared.	Learning curve	Learning curve	
28	10 ways to Readworks in the classroom	The aim is to use an online platform to improve literacy skills in schools. The benefits of the Readworks program are stated and elaborated on step by step.	Learning curve	Learning curve	
29	7 ways to assess without testing	7 practical ways are shared on how to assess children without testing them. Assessing abilities are done in a way that children enjoy.	Learning curve	Test	*
30	The enduring residue of project-based learning	Insight is shared on how to present project-based learning in a meaningful and purposeful way. Emphasis is placed on the reason why teachers and students do what they do and the appropriate use of questions are stressed in project-based learning.	Learning curve	Learning curve	
31	A writing strategy that works for every student every time	The writer is reminded to remember the reason for documenting his chain of thoughts. It is suggested that if one knows the purpose of writing then the expression of thoughts will be led by the purpose. The pre-writing strategy T.A.P.E is shared with the reader.	Learning curve	Learning curve	
32	8 types of imagination	The effect of imagination on the brain is explained and the importance of it is stressed. 8 types of imagination and their use are introduced.	Learning curve	Learning curve	
33	What students will learn in the future	The 8 new content areas for future education is introduced after a reflection of the past education areas. The running theme is that the world is constantly changing.	Metacognition	Metacognition	
34	27 ideas for students who finish their work early	Practical tips on how to handle early finishers in the classroom are provided for teachers.	Help	Help	
35	How deductive thinking can drive student designed research	Insight into the student's process when selecting a topic to write about. Tips are shared to slow the process down and to help teachers assist students in this process, common mistakes are shared as well.	Help	Help	
36	Refuse to be a boring teacher	Boredom result in intentional planning, the article addresses the temptation to become boring through the	Help	Help	

ISBN 978-615-5511-25-7

		routine of the everyday life and suggest 8 ways to be a less boring teacher.			
37	30 questions teachers can ask at their next job interview	A reminder that the teacher is interviewing the school just as much as they are introducing themselves. 30 proposed questions are stated that teachers can ask the school.	Metacognition	Metacognition	
38	10 strategies to make learning feel more like a game	Making the classroom work like a video game could potentially be enjoyable to students. 10 strategies are shared to make this practical.	Learning curve	Learning curve	
39	What are the habits of the mind	To enhance performance under challenging conditions that demand strategic reasoning, insightfulness, perseverance, creativity, and craftsmanship to resolve complex problems certain dispositions and habits of the mind need to be internalized in the classroom. The habits of the mind are listed individually.	Learning curve	Metacognition	*
40	A really, really cool website for students who think they hate math	A website called Numberphile is a problem-based learning kind of approach that makes learning math more enjoyable for scholars	Help	Learning curve	*
41	How to never run out of new ideas as a teacher	How a teacher approaches their teaching influences the way students approach their learning. This article stresses the importance for teachers to have imaginative minds with creative ideas.	Help	Metacognition	
42	7 ways to improve parental improvement in the classroom	7 ways are shared for teachers to communicate and interact with parents. The emphasis is placed on the relationship between the teacher and the parent.	Help	Help	
43	Learning is complex, what do we know so far?	Learning is redefined in the modern context and its relationship to neuroscience. The effect of learning on the brain is briefly explained.	Learning curve	Learning curve	
44	Learning beyond the curriculum	A brief overview of what we know about learning thus far is shared and its effect on the brain. Learning must go further than the classroom, further than teacher-based learning.	Learning curve	Learning curve	
45	5 ways to engage reluctant learners	This article suggests that intrinsic motivation lies at the heart of all learning. 5 strategies on how to unlock this motivation are shared with the teacher-student relationship as the foundation.	Help	Goal and success	*
46	This is one of the best games to teach social studies	An introduction to a few games that can be integrated with learning and teaching students social studies.	Learning curve	The learning curve	
47	12 of the best ASMR videos with no talking	A list of "Autonomous Soothing Meridian Response" sounds that students find soothing.	Help	Plan	*
48	What teachers want to hear students say	A list of things students say that should light up the heart of a teacher and help with assurance that the teacher's teaching is impacting.	Metacognition	Metacognition	
49	9 strategies for getting to know your students	The importance of knowing one's students are stressed and the impact of knowing them on the teaching relationship is elaborated. Practical strategies are shared.	Help	Help	
50	3 types of project-based learning symbolise its evolution	The significance of project-based learning in the 21st century is stressed and its potential and methods are shared. 3 types of project-based learning are introduced.	Learning curve	Learning curve	
					5 / 50 10%

Discussion and Findings

The goal of the article was to see if personalised guidance and support for learning could be provided to educators who want to master aspects of the learning sciences. Guidance and support to this effect was proposed by choosing one set of learning strategies, based on mental schema theory. Following these principles, a scaffolding framework was developed, consisting of a metaphor of learning as a journey, with aspects of learning as guideposts along the way. The metaphor of the Fibonacci cycle was used to indicate that each aspect on its own is important and useful, but when used in conjunction with each other they gain in strength and value. To test the applicability of the scaffolding framework, two websites with popularised

ISBN 978-615-5511-25-7

articles on research on teaching and learning was chosen, to see if the individual articles which are published randomly and without a specific curriculum or learning goal in mind, can be understood coherently and in a way that will provide guidance and support to master learning.

The first finding was that all the articles could be interpreted to fit under one or more of the seven aspects along the learning journey. Two readers were used, namely a post-graduate student in educational psychology, and the author of the article who is also the originator of the scaffolding framework.

Regarding the 50 articles taken from the MindShift website, there was a 78% correspondence and consensus as to where the articles belong. The 22% difference is quite high, but it can be ascribed to the fact that the student was deliberately given just the graphic of the spiral with the headings and short description to guide her, while the author had a much longer experience with the framework. Seen as such, it is actually a remarkably high percentage of agreement, which points to the intuitiveness of the framework.

The percentage of agreement on the TeachThought website was 90%, which is 12% higher than the previous one. The higher percentage may be ascribed to the fact that the student had the experience of the first one, as well as having had access to how the author interpreted the first one, and see where he differed from her interpretation.

It therefore does seem that the framework is successful in guiding and supporting people to understand aspects of learning.

Looking at the spread of articles in relation to the aspects of learning, the following picture emerges.

Table 3:

Spiral Theme	MindShift 50	TeachThought 50	Totals 100
Plan	6	1	7
Learning Curve	12	21	33
Mistakes	0	1	1
Help	11	12	23
Test	1	1	2
Goal	1	1	2
Metacognition	19	13	32
	50	50	100

Most of the 50 articles in the MindShift site were about metacognition, while in the TeachThought site it was about the learning curve. Overall, these two aspects were almost even, while the aspect of help and support came third in both separately and overall.

This gives a rough idea of where the focus of research might be, although it is too small a sample to be specific. What it does help, though, is to guide and support learners to see the bigger picture, and not only the unrelated individual articles. They become learners who

ISBN 978-615-5511-25-7

understand, not merely consumers of what is being presented to them. Some of the aspects along the learning journey received very little attention. Seeing that as such, may help learners to go look deliberately for articles and information regarding those aspects. In this way they not only personalise their learning, but they also are in control of becoming a person well versed in every aspect of learning.

What did come to the fore, was that it is important to make a distinction on who is reading the articles, and for what reason. Both websites are aimed at teachers. The seven aspects along the learning journey has a different slant to it when read for teaching purposes and supporting learning, over against reading it for personal learning purposes. It does seem that there should be two Golden Spirals – the one for teachers, and the other for learners.

To summarise and conclude, the following statements are in order:

- Research findings and reporting thereof comes in snippets and in disjointed format. It is left to the reader / practitioner / researcher to make sense of it, and fit it into some kind of framework.
- Disjointed, atomised information is more difficult to evaluate critically because there is no frame of reference against which to measure it.
- People are usually well versed or experts in some fields, but not all, making it difficult to assess the validity and usability of all findings.
- The Golden Spiral scaffolding framework has successfully shown itself as a tool to make sense of research findings in this vast field.
- Because findings are lumped together in smaller fields it is easier to remember and apply and also easier to assess for validity because it can be compared to similar findings.
- The Golden Spiral is a metaphor that makes the act of learning by means of schema building easier. The end result of the process is that schemas on various levels are being created. There is an overarching metacognitive schema, guiding thought about learning. Then there is the comprehensive schema, where all the aspects work together in a coherent and mutually supportive role. Lastly, there are sub-schemas, where each aspect is being elaborately understood and put into action in real life learning situations.
- Using it in this way, a mental schema could be created, guiding and supporting learning. In this way, one can see the forest, as well as the trees.

References

1. Al-Issa, A. (2006). Schema theory and L2 reading comprehension: Implications for teaching. *Journal of College Teaching and Learning, 3*(7), 41–48.
2. An, D., & Carr, M. (2017). Learning styles theory fails to explain learning and achievement: Recommendations for alternative approaches. *Personality and Individual Differences, 116*, 410–416.

ISBN 978-615-5511-25-7

3. Ansari, D., Coch, D., & de Smedt, B. (2011). Connecting education and cognitive neuroscience: Where will the journey take us? *Educational Philosophy and Theory, 43*(1), 37–42.
4. Arbib, M. A. (1992). Schema theory. In S. C. Shapiro (Ed.), *The encyclopedia of artificial intelligence* (pp. 1427–1443). Wiley Interscience.
5. Aydin, M., & Sunbul, A. M. (2012). Effect of the verbal mnemonics on students' achievements and their attitudes. *Procedia – Social and Behavioral Sciences, 47*,1506–1510.
6. Bluck, S., & Habermas, T. (2000). The life story schema. *Motivation and Emotion, 24*(2), 121–147.
7. de Bruyckere, P., Kirschner, P. A., & Hulshof, C. D. (2015). *Urban myths about learning and education.* Academic Press.
8. Curry, L. (1990). A critique of the research on learning styles. *Educational Leadership, 48*(2), 50–56.
9. Dekker, S., Lee, N. C., Howard-Jones, P., & Jolles, J. (2012). Neuromyths in education: Prevalence and predictors of misconceptions among teachers. *Frontiers in Psychology, 3*, 1–8.
10. Dembo, M. H. & Howard, K. (2007). Advice about the use of learning styles: A major myth in education. *Journal of College Reading and Learning, 37*(2), 101–109.
11. Derry, S. J. (1996). Cognitive schema theory in the constructivist debate. *Educational Psychologist, 31*(3), 163–174.
12. Doyle, H. (2011). *College and technical college students' perceptions of their learning success based upon understanding multiple intelligences: A mixed method research.* Retrieved from http://hollyjdoyle.efoliomn.com/Uploads/Doyle. Dissertation.
13. Doyle, W., & Rutherford, B. (1984). Classroom research on matching learning and teaching styles. *Theory into practice, 23*(1), 20-25.
14. Dündar, S., & Gündüz, N. (2016). Misconceptions regarding the brain: the neuromyths of preservice teachers. *Mind, Brain, and Education, 10*(4), 212-232.
15. Ferrero, M., Garaizar, P., & Vadillo, M. A. (2016). Neuromyths in Education: Prevalence among Spanish Teachers and an Exploration of Cross-Cultural Variation. *Frontiers in Human Neuroscience, 10.*
16. Geake, J. (2008). Neuromythologies in education. *Educational Research, 50*(2), 123–133.
17. Ghosh, V. E., & Gilboa, A. (2014). What is a memory schema? A historical perspective on current neuroscience literature. *Neuropsychologia, 53*, 104-114.
18. Gleichgerrcht, E., Lira Luttges, B., Salvarezza, F., & Campos, A. L. (2015). Educational neuromyths among teachers in Latin America. *Mind, Brain, and Education, 9*(3), 170-178.

ISBN 978-615-5511-25-7

19. Gous, I. G. P. (2015). Learning strategies. In Gous, I.G.P. & Roberts, J. (Eds.), *Teaching life orientation (Senior and FET phases)*. Cape Town: Oxford University Press. ISBN 978 0 19 905364 3
20. Gutierrez, K. D., & Rogoff, B. (2003). Cultural ways of learning: Individual traits or repertoires of practice. *Educational Researcher, 32*(5), 19–25.
21. Horadam, A. F. (1961). A generalized Fibonacci sequence. *The American Mathematical Monthly, 68*(5), 455-459.
22. Jitendra, A. K., Griffin, C. C., Haria, P., Leh, J., Adams, A., & Kaduvettoor, A. (2007). A comparison of single and multiple strategy instruction on third-grade students' mathematical problem solving. *Journal of Educational Psychology, 99*(1), 115–127.
23. Kampwirth, T. J., & Bates, M. (1980). Modality preference and teaching method: A review of the research. *Academic Therapy, 15*(5), 597-605.
24. Lewis, P. J. (2011). Storytelling as research/research as storytelling. *Qualitative Inquiry, 17*(6), 505–510.
25. Mayer, R. E. (2008). Incorporating Individual Differences into the Science of Learning: Commentary on Sternberg et al. (2008). *Perspectives on Psychological Science, 3*(6), 507–508. http://dx.doi.org/10.1111/j.1745-6924.2008.00093.x.
26. Mayer, R. E., & Mayer, E. (2014). *Advances of learning in applying and the instruction science to education.*
27. McClelland, J. L. (2013). Incorporating rapid neocortical learning of new schema-consistent information into complementary learning systems theory. *Journal of Experimental Psychology: General, 142*(4), 1190.
28. McTighe, J., & Thomas, R. S. (2003). Backward design for forward action. *Educational Leadership, 60*(5), 52-55.
29. McVee, M. B., Dunsmore, K., & Gavelek, J. R. (2005). Schema theory revisited. *Review of Educational Research, 75*(4), 531–566.
30. Meltzoff, A. N., Kuhl, P. K., Movellan, J., & Sejnowski, T. J. (2009). Foundations for a new science of learning. *Science, 325*(5938), 284–288.
31. Mostafa, E. A., & El Midany, A. A. H. (2017). Review of mnemonic devices and their applications in cardiothoracic surgery. *Journal of the Egyptian Society of Cardio-Thoracic Surgery, 25*, 79–90.
32. Mowrer, R. R., & Klein, S. B. (Eds.) (2001). *Handbook of Contemporary Learning Theories.*
33. Narvaez, D., & Bock, T. (2002). Moral schemas and tacit judgement or how the defining issues test is supported by cognitive science. *Journal of Moral Education, 31*(3), 297–314.

ISBN 978-615-5511-25-7

34. Nguyen, L., Brunicardi, F. C., DiBardino, D. J., Scott, B. G., Awad, S. S., Bush, R. L., & Brandt, M. L. (2006). Education of the modern surgical resident: Novel approaches to learning in the era of the 80-hour workweek. *World Journal of Surgery, 30,* 1120–1127.

35. O'Niel, H. F. (Ed.) (1978). *The educational technology series.* Academic Press.

36. Offredy, M., & Meerbeau, E. (2005). The use of "think aloud" technique, information processing theory and schema theory to explain decision-making processes of general practitioners and nurse practitioners using patient scenarios. *Primary Health Care Research and Development, 6,* 46–59.

37. Ortony, A., & Rumelhart, D. E. (1977). The representation of knowledge in memory. In R.C. Anderson, R.J. Spiro, & W.E. Montague (Eds.), *Schooling and the acquisition of knowledge* (pp. 99-135). Lawrence Erlbaum Associates.

38. Panou, D. (2013). Equivalence in translation theories: A critical evaluation. *Theory and Practice in Language Studies, 3*(1), 1–6.

39. Plant, K. L., & Stanton, N. A. (2012). Why did the pilots shut down the wrong engine? Explaining errors in context using Schema Theory and the Perceptual Cycle Model. *Safety Science, 50,* 300–315.

40. Plant, K. L., & Stanton, N. A. (2013). The explanatory power of Schema Theory: theoretical foundations and future applications in Ergonomics. *Ergonomics, 56*(1), 1-15.

41. Purdy, N. (2008). Neuroscience and education: how best to filter out the neurononsense from our classrooms? *Irish Educational Studies, 27*(3), 197-208.

42. Purdy, N., & Morrison, H. (2009). Cognitive neuroscience and education: Unravelling the confusion Introduction: recent research into cognitive neuroscience and education. *Oxford Review of Education, 35*(1), 99–109.

43. Roediger, H. L. (2006). Bartlett, Frederic Charles. In J. W. & Sons (Eds.), *Encyclopedia of Cognitive Science.*

44. Rumelhart, D. E. (1984). Schemata and the cognitive system. In R. S. Wyer, Jr. & T. K. Srull (Eds.), *Handbook of social cognition* (pp. 161-188). Mahwah, NJ: Lawrence Erlbaum Associates Publishers.

45. Rumelhart, D. E. (1991). Understanding understanding. In W. Kessen, A. Ortony, & F. Craik (Eds.), *Memories, thoughts and emotions: Essays in honor of George Mandler* (pp.257-275). Hillsdale, NJ: Lawrence Erlbaum Associates.

46. Rumelhart, D. E. (2017). Schemata: The building blocks of cognition. In R.J. Spiro et al. (Eds.), *Theoretical issues in reading comprehension* (pp. 33-58). Routledge.

47. Rumelhart, D. E., & Norman, D. A. (1980). *Analogical processes in learning.* Technical Report.

ISBN 978-615-5511-25-7

48. Schmidt, R. A. (1975). A schema theory of discrete motor skill learning. *Psychological Review, 82*, 225–260.

49. Sherwood, D. E., & Lee, T. D. (2003). Schema theory: Critical review and implications for the role of cognition in a new theory of motor learning. *Research Quarterly for Exercise and Sport, 74*(4), 376–382.

50. Snider, V. E. (1990). What We Know about Learning Styles from Research in Special Education. *Educational Leadership, 48*(2), 53.

51. Stahl, S. A. (1999). Different Strokes for Different Folks? A Critique of Learning Styles. *American educator, 23*(3), 27-31.

52. Tardif, E., Doudin, P. A., & Meylan, N. (2015). Neuromyths among teachers and student teachers. *Mind, Brain, and Education, 9*(1), 50–59.

53. Tokuhama-Espinosa, T. N. (2008). *The scientifically substantiated art of teaching: A study in the development of standards in the new academic field of neuroeducation (mind, brain, and education science).* Retrieved from http://ovidsp.ovid.com/ovidweb.cgi?T=JS&PAGE=reference&D=psyc6&NEWS=N&AN=2008-99210-276

54. Tokuhama-Espinosa, T. N. (2011). *Mind, brain, and education science: A comprehensive guide to the new brain-based teaching.* New York, NY.: W. W. Norton & Company, Inc.

55. Tokuhama-Espinosa, T. N. (2014). *Making classrooms better: 50 practical applications of mind, brain, and education science.* Retrieved from http://ovidsp.ovid.com/ovidweb.cgi?T=JS&PAGE=reference&D=psyc11&NEWS=N&AN=2012-32695-000

56. Tokuhama-Espinosa, T. N. (2016). *Theories of how humans learn.* Retrieved from https://www.youtube.com/watch?v=mCrzE5Uj3zU

57. Wiggins, G. P., Wiggins, G., & McTighe, J. (2005). *Understanding by design.* Ascd.

58. Worthen, J. B., & Hunt, R. R. (2011). *Mnemonology: Mnemonics for the 21st century.* Psychology Press.

59. Xiao-Hui, L., Jun, W., & Wei-Hua, W. (2007). Analysis of schema theory and its influence on reading. *US-China Foreign Language, 5*(11), 18–21.

60. Xie, X. (2017). The influence of schema theory on foreign language reading comprehension. *The English Teacher, 34*, 64-75. Retrieved from https://journals.melta.org.my/index.php/tet/article/view/331/221

61. Zhao, X., & Zhu, L. (2012). Schema theory and college English reading teaching. *English Language Teaching, 5*(11), 111–117.

62. Zhou, M. Y., & Brown, D. (Eds.) (2015). *Educational learning theories* (2nd ed.). Education Open Textbooks.

ISBN 978-615-5511-25-7

Learning Explained: A Schema-building Scaffolding Framework to Make Sense of Personalised Guidance and Support for Learning

Ignatius G.P. Gous

ISBN 978-615-5511-25-7

Towards Personalized Guidance and Support for Learning
Proceedings of the 10th European Distance and E-Learning Network Research Workshop, 2018
Barcelona, 24-26 October, 2018
ISBN 978-615-5511-25-7

TEACHER ROLES AND DIGITAL THREATS: PREVENTING AND ADDRESSING CYBERBULLYING IN EUROPEAN SCHOOLS

Alan Bruce, Imelda Graham, Universal Learning Systems, Ireland

Summary

The rapid growth of the internet and social media has provided a new platform for bullying, although traditional forms continue to exist. Cyber bullying is the term used to describe any aggressive, intentional act, behaviour or communication undertaken an individual or group, using electronic and digital means against a vulnerable victim, repeatedly and over time. The reality and impact of bullying has been the subject of extensive research over many years in all countries. Bullying occurs throughout the world and can occur at many stages in the course of life, from childhood to adolescence and in to adulthood, in private, educational and work settings. Bullying is a distinctive pattern of harm and humiliation of others, especially those who are in some way smaller, weaker, younger or in any way more vulnerable than the bully. Bullying is a deliberate and repeated attempt to cause harm to others of lesser power.

This paper reviews the issues and themes identified in the international research on cyberbullying. It summarizes the key factors involved and provides a comparative analysis based on research undertaken in five countries and schools (Ireland, Spain, Italy, Poland and Romania). In addition, the paper identifies innovative learning strategies, digital resources and detailed findings from surveys of teachers, students and parents that offer techniques and actions to educational establishments to ameliorate this phenomenon. All this is designed to identify and pinpoint the critical issues involved in developing evidence-based responses to the issue of cyberbullying in European schools.

The anonymity and seeming ubiquity of the threatening remarks or actions that constitute bullying can have a deeply disturbing and disconcerting impact. The sense of menace is amplified by the uncertainty and fear of being stalked and pursued. Many studies over several years have examined the negative effects that cyberbullying can have on victims (and also on bullies themselves). Victims are more likely to report lower grades, poor concentration, anxiety and a range of academic problems as a consequence of experiencing cyber bullying. Both victims and bullies often report higher levels of stress, depression and low self-esteem. A particularly serious consequence of cyber bullying, as also in harassment in general, is suicide.

Research on cyberbullying is plagued by inconsistent findings and exaggerated claims about prevalence, development over time, and effects. To build a useful and coherent body of knowledge, it essential to achieve some degree of consensus on the definition of the phenomenon as a scientific concept and that efforts to measure cyberbullying are made in a

"bullying context". This will help to ensure that findings on cyberbullying are not confounded with findings on general cyber-aggression or cyber-harassment. We tentatively recommend that cyberbullying should be regarded as a subcategory or specific form of bullying, in line with other forms such as verbal, physical, and indirect/relational.

Dimensions of Cyberbullying

Cyberbullying has become an international public health concern among adolescents. On that basis alone, significant further study is indicated and recommended in all the relevant literature. A review of the available evidence suggests that cyberbullying poses a threat to adolescents' health and well-being at many levels. A plethora of correlational studies have demonstrated a cogent relationship between adolescents' involvement in cyberbullying and negative health indices. Adolescents targeted via cyberbullying are found in all reports to have increased depression, loneliness, anxiety, suicidal behaviour, and a range of depressive affects and somatic symptoms. On the other hand, perpetrators of cyberbullying are more likely to report increased substance use, aggression, and delinquent behaviours. Adolescents in most advanced industrialized countries are moving beyond using the Internet as an "extra" in everyday communication (cyber utilization) to using it as a "primary and necessary" mode of communication (cyber immersion). In fact, 95% of adolescents in the United States are now connected to the Internet. This shift from face-to-face communication to online communication has created a unique (and potentially harmful) dynamic for social relationships – a dynamic that has recently been explored in the literature as cyberbullying and Internet harassment.

Compared to traditional bullying, cyberbullying is unique: it reaches an unlimited audience with increased exposure across time and space, preserves words and images in a more permanent state, and lacks any supervision. Furthermore, perpetrators of cyberbullying do not see the faces of their targets. Subsequently they may not understand the full consequences of their actions, thereby decreasing important feelings of personal accountability. This has often been referred to in the literature as the "disinhibition effect". Given that cyberbullying is a relatively recent phenomenon, it is important to note that there are still definitional and methodological inconsistencies throughout the literature. For example, some scholars have chosen to adopt a more conservative criterion to define cyberbullying (for example, "willful and repeated harm inflicted through the use of computers, cell phones, and other electronic devices"), while others have adopted a broader definition (for example, "using electronic means to intentionally harm someone else"). The term cyberbullying represents an umbrella term. This includes related constructs such as Internet bullying, online bullying, and information communication technologies and Internet harassment.

Research over many years has revealed a significant relationship between involvement in cyberbullying and affective disorders. For example, results indicate that there is a significant relationship between *cyber-victimization* and depression among adolescents, and among college students. Specifically, results showed that higher levels of cyberbullying victimization were related to higher levels of depressive affect. Raskauskas and Stoltz (2007) asked

ISBN 978-615-5511-25-7

adolescents open-ended questions about the negative effects of cyberbullying. Notably, 93% of cyber-victims reported negative effects. Reactions to being cyberbullied may also depend on the form of cyberbullying. For example, Ortega et al. (2012) found that different forms of cyberbullying may elicit different emotional reactions – for instance, being bullied online may evoke a different emotional reaction than being bullied via mobile phones. In terms of predicting the most deleterious outcomes, past studies have shown that pictures/video images were the most harmful to adolescents.

Taken together, results from many worldwide studies suggest that involvement in cyberbullying puts adolescents at risk for increased problems and complications around internalization and health function. These include many dimensions: depression, anxiety, suicidal ideation, and psychosomatic issues (difficulties sleeping, headaches, and stomach aches), as well as a loss of connection from parents and peers. All this serves to threaten security and adolescents' basic fundamental need for meaningful connections. In addition, participation in cyberbullying also places adolescents at risk for increased externalizing issues, such as substance use and delinquent behaviour. Recently, researchers have begun to examine how developmental changes in adolescent risk factors affect subsequent involvement in cyberbullying behaviour. Modecki et al. (2014) have investigated the role of increasing developmental problems (problem behaviour and poor emotional well-being) among adolescents and how these might predict subsequent involvement in cyberbullying over a 3-year period (while applying consideration for sex and pubertal timing). The findings demonstrate that adolescents' early stage developmental increases in problem behaviour predicted their involvement with cyberbullying at later stages.

In summary of all the research findings and evidence, research has demonstrated that cyberbullying, victimization and perpetration have a significant detrimental impact on adolescents' health. In fact, the studies reviewed above all suggest that cyberbullying is an emerging international public health concern of significant scale, related in turn to serious mental health concerns. There is ample evidence of serious and sustained significant impact on adolescents' levels of depression, anxiety, self-esteem, emotional distress, substance use, and suicidal behaviour. Moreover, cyberbullying is also related to a wide range of adolescents' physical health concerns.

Responding to Cyberbullying

The evidence and research on the negative and serious effects and impact of cyberbullying is extensive and remarkable. In such a situation, meaningful prevention and intervention efforts are a priority – particularly for those involved in education. Research also tends to indicate, however, that effective prevention and intervention efforts to address cyberbullying are currently lacking and insufficient. Reports and studies all confirm the suggestion that prevention efforts directed towards reducing cyberbullying should address adolescents' self-esteem. This is the key factor, followed by specific problem behaviours.

ISBN 978-615-5511-25-7

Meaningful social connection is key to effective prevention and intervention efforts. Finally, the results from recent studies and investigations conducted by Hinduja and Patchin (2007) suggest that adolescents' socializing agents (friends, family, and adults at school) play an important role in whether or not adolescents choose to cyberbully others. Surveying a random sample of 4,441 adolescents, the study results showed that adolescents who believed that several of their friends were involved with cyberbullying were more likely to cyberbully others themselves. These results suggest the need for prevention efforts designed around correcting the "misperceived" norm of cyberbullying.

In a major study published in 2016, the European Parliament (2016, "Cyberbullying Among Young People") reviewed the position of cyberbullying in Europe and compared the responses of the various Member States. This study provides an overview of the extent, scope and forms of cyberbullying in the European Union. It factors into account the age and gender of both victims and perpetrators as well as the medium used. The lack of harmonization at European level is highlighted by the fact that only Belgium, Germany, Italy, Ireland, the UK and Spain have dedicated juvenile courts to try cyberbullying cases.

The study also highlighted positive initiatives started by authorities to tackle the phenomenon, such as the implementation of early warning systems in schools, with a series of indicators that allow teachers to spot cases and inform parents or guardians. Of the EU28, only Spain, Italy, Greece, Finland, Croatia and Belgium require teachers to oversee this process. The European Commission defines cyberbullying as "repeated verbal or psychological harassment carried out by an individual or a group against others through online services and mobile phones". Cyberbullying is generally understood as bullying taking place on the internet. There is no single definition of cyberbullying agreed upon internationally or at European level. However, attempts to define this phenomenon have been made by international organizations, EU institutions and academia. There are no standards specifically targeting cyberbullying at international level. However, Article 19 of the UN Convention on the Rights of the Child (UNCRC) on the protection from all forms of violence is applicable to bullying online. At regional level, the Council of Europe has adopted a range of legally binding measures relevant to bullying online. The EU has only a 'supplementary' role in this field consisting of supporting, coordinating or supplementing the initiatives adopted by Member States at national level.

At national level, none of the 28 EU Member States have criminal legal provisions targeting cyberbullying specifically. The most common good practices in the nine Member States selected for further analysis can be grouped around two main areas: Education/awareness raising; Child protection. The Report's conclusions affirm that a cultural change by victims, perpetrators and bystanders is essential. To this end, support and educational programs for all those involved and not involved in bullying incidents should be created. Reporting mechanisms such as helplines and the installation of reporting tools in children's computers to signal incidents should also be put in place. These mechanisms have been created in the Netherlands in the form of a report button that can be activated when children encounter online threats.

ISBN 978-615-5511-25-7

The APPs Project Research

The "Addressing teaching to Prevent cyber-bullying Phenomenon at Schools" (APPs) project was initiated in 2017 and funded under the Erasmus + program of the European Union. Its research aim is to improve the knowledge about school needs in terms of prevention of the cyber-bullying phenomenon, with special attention to the main sub-areas such as xenophobia, racism, gender-based harassment and disability to create an analytical framework that will be used in the development of subsequent Vertical Learning Modules (VLM). The partners comprised a network of schools in Italy, Romania, Poland and Spain. Research was undertaken by the Irish partner, Universal Learning Systems.

The Primary Research for the APPs project was conducted in a variety of ways, based upon the emerging findings of the secondary and the baseline research. It was determined that surveys would provide the main bulk of the research, to be conducted among the key stakeholders in the partner schools: the teachers, students and the parents. In addition, the e-training element for partner participants provided a direct link to the partners themselves on all of the areas relevant to the project aims and resulted in some valuable findings.

The baseline research was in the form of a survey sent to all partners. The purpose of this survey was to establish a clear picture of the schools involved, statistically and with regard to relevant issues in each country and school, such as existing cyberbullying policies. Differences emerged with some schools, for example, having policies and others not. All partners responded, and the sharing of this information across countries is expected to provide opportunities to learn from each other.

The surveys, using Google Surveys, were sent out for distribution among the APPs project partners. All ethical issues were explained in detail and good practice was followed in terms of anonymity and confidentiality. Survey questions were administered to three groups in the partner countries with participating schools (Italy, Spain, Romania, Poland):

- Parents;
- Teachers;
- Students.

The rate of the numbers responding were exceptionally high. This ensured a satisfactory outcome for the findings and reinforced the validity. Among the students, 440 responded out of a possible 1245 (as per figures supplied in the baseline survey for each school). At 35%, this is a notably high response rate for young people when they are self-responding. For parents and for teachers, the response rates were extremely high: Teachers were 99 out of a possible 122 (as per figures supplied in the baseline survey for each school), and Parents were 142 out of a possible 192 (as per figures supplied in the baseline survey for each school). These response rates reflect the keen interest in, and importance of, the subject of cyberbullying and the many issues arising.

ISBN 978-615-5511-25-7

Key Points Emerging from Surveys have been detailed according to the three categories investigated. It should be noted that the percentages mentioned reflect the numbers responding to each particular question rather than a percentage of the overall response rate.

Key points: Students

- 23.6% did not understand cyberbullying;
- 41.6% did not know about school's response;
- 69.6 did not know what supports were in school;
- 46.1% said they had not discussed cyberbullying with their parents;
- 16% said teachers had not discussed with them;
- 52.7% do not know what to do if it happens;
- 9.6% direct experience;
- 38.9% indirect experience.

Key Points: Teachers

- 55.6% have policies in place;
- 46.9% have procedures;
- 59.6% do not know about school/community supports;
- 87.8% said they discussed cyberbullying in school (65.2% of these were informal);
- 61.9% had no professional support – but 54/3% had in-service training!

Key Points: Parents

- 94.4% understood cyberbullying;
- 75.7% discussed with children (n.b. children claimed only 46.1%);
- 55.4% knew of school supports (32.8% knew community supports);
- 67.2% said they would recognize signs of cyberbullying;
- 9.8% said a child had experienced it;
- age 12 has a peak rate for experiencing cyberbullying;
- 24.3% approached school re their child (n.b. 61.5% [26 people] were not satisfied with school's response);
- 25% sought outside help;
- 11.1% used the police;
- 72.3% discuss online safety;
- 66.2% of 139 responses allow children use ICT in their bedrooms (53% restrict usage/time);
- many parents said a solution was to be more interested in their children's activities ad lives.

Critical Issues and Recommendations

From the survey findings, a number of critical issues emerged that concern issues such as providing information for parents, fostering communication about cyberbullying between children and parents and information on available supports.

ISBN 978-615-5511-25-7

- More information is required for children regarding what to do in the case of cyberbullying, whether witnessing or experiencing it.
- Paying especial consideration to the peak negative experiences is critical at the age of 12, in advance of this age, during it and among older child who may be able to play buddy/mentor roles.
- Review of current policies and procedures, in consultation with families and children, is recommended strongly
- More consultation/cooperation with children and parents in drawing up new policies and procedures is essential.
- Recognition of the intrusive nature of cyberbullying and the psychological impact is vital.
- More information for parents regarding supports already existing is recommended.
- More information for children on all aspects of cyberbullying, which should be developed in the VLM's and in the development and dissemination of the policies and procedures, is strongly endorsed and recommended.
- Children, teachers and parents have useful ideas for preventative strategies.
- Helping parents communicate issues with their children is a key role and objective in any interventions.

Conclusions

The primary research has provided useful results for the APPs project, addressing the key questions outlined in the project application. It has reached out and included all stakeholders in each partner country and offers a useful framework to respond to this growing phenomenon through training.

The findings of the secondary research illustrate the widespread nature of this phenomenon. The setting out of innovative learning strategies gives strong evidence-based findings to enable the partners in the APPs project to realize the core aims of the project.

When partners integrate the findings of all parts of the research they will be facilitated to develop successful training modules that will provide a sustainable resource that may be shared internationally with schools and address in a meaningful manner the phenomenon of cyberbullying.

It is important to note that the majority of studies investigating the relationship between cyberbullying behaviours and adolescent health have been correlational in nature. While correlational studies are an important first step to understanding the impact of cyberbullying, longitudinal studies are now needed to increase our understanding of how cyberbullying experiences affect adolescents' health over time. By using longitudinal designs, it will be possible to test whether adolescents' depressive symptoms, social anxiety, or suicidal tendencies related to cyberbullying are antecedents or consequences. For example, it is possible that depressive symptomology could either be an antecedent or an effect of cyberbullying victimization. Longitudinal study designs permit us to examine both of these possibilities with more clarity.

ISBN 978-615-5511-25-7

Findings from the literature reviewed have significant implications for health care professionals, educators, and caring adults. First and foremost, the studies described throughout urge educators, counsellors, and health care professionals to address cyberbullying when assessing adolescents' physical and psychological health concerns. It is clear that adolescents who are involved in cyberbullying experiences require support. However, evidence suggests that the majority of adolescents do not seek help from adults when involved in cyberbullying. Therefore, it is important to take a proactive approach. In the final analysis, research suggests the fact that support for identification, prevention and intervention on cyberbullying should come from multiple professional communities that serve youth.

These include:

- Educational (teachers, guidance counsellors, administrators, chaplains, professionals working in the schools).
- Behavioural health (clinicians treating adolescents with mental health concerns, psychologists, therapists).
- Medical (paediatricians asking about cyberbullying experiences during visits, specialists).

Sensitive probing about cyberbullying experiences is warranted when addressing adolescent health issues such as depression, substance use, suicidal ideation, as well as somatic concerns. Routine screening techniques can be developed to assist in uncovering the harm endured through cyberbullying to help support adolescents recovering from associated trauma. Finally, research suggests a strong need for comprehensive, school-based programs directed at cyberbullying prevention and intervention. Education about cyberbullying should be integrated into school curriculums and the community at large, for example, by engaging adolescents in debates and community discussions related to cyberbullying legislation, technology, accountability, and character. This ultimately concerns students and their health and wellbeing. Students should therefore be at the forefront of all efforts and directly involved to guarantee some measure of success.

References

1. Apollo, A. M. (2007). Cyberbullying: Taking the fight online. Retrieved from http://saferschools.blogspot.com/2007/02/october-9-2005-bonita-banner.html
2. Fanti, K. A., Demetriou, A. G., & Hawa, V. V. (2012). A longitudinal study of cyberbullying: Examining risk and protective factors. *European Journal of Developmental Psychology, 9*(2), 168-181. http://dx.doi.org/10.1080/17405629.2011.643169
3. Finkelhor, D., Mitchell, K., Wolak, J., & Ybarra, M. (2006). Examining Characteristics and Associated Distress Related to Internet Harassment: Findings from the Second Youth Internet Safety Survey. *Pediatrics, 118*(4).
4. Hanewinkel, R. (2004). Prevention of bullying in German schools: An evaluation of an anti-bullying approach. In P. K. Smith, D. Pepler, & K. Rigby (Eds.), *Bullying in schools: How successful can interventions be?* (pp. 55-79). Cambridge: Cambridge University Press.

ISBN 978-615-5511-25-7

5. Hinduja, S., & Patchin, J. W. (2007). Offline consequences of online victimization: School violence and delinquency. *Journal of School Violence, 6*(3), 89–112.
6. Modecki, K. L., Minchin, J., Harbaugh, A. G., Guerra, N. G., & Runions, K. C. (2014). Bullying Prevalence Across Contexts: A Meta-analysis Measuring Cyber and Traditional Bullying. *Adolescent Health, 55*(5), 602–11.
7. Olweus, D. (1978). *Aggression in the schools. Bullies and whipping boys.* London: John Wiley & Sons.
8. Ortega, R., Elipe, P., Mora-Merchán, J. A., Genta, M. L., Brighi, A., Guarini, A., Smith, P. K., Thompson, F., & Tippett, N. (2012). The emotional impact of bullying and cyberbullying on victims: a European cross-national study. *Aggressive Behaviour, 38*(5), 342-56.
9. Pepler, D. J., Craig, W., Ziegler, S., & Charach, A. (1994). An Evaluation of an Anti-Bullying Intervention in Toronto Schools. *Canadian Journal of Community Mental Health, 13*, 95-100.
10. Raskauskas, J., & Stoltz, A.D. (2007). Involvement in traditional and electronic bullying among adolescents. *Developmental Psychology, 43*, 564–575.
11. Schenk, A., & Fremouw, W. (2012). Prevalence, Psychological Impact, and Coping of Cyberbully Victims among College Students. *Journal of School Violence, 11*, 21-37.
12. Slonje, R., & Smith, P. K. (2008). Cyberbullying: Another Main Type of Bullying? *Scandinavian Journal of Psychology, 49*, 147-154.
13. Dehue, F., Bolman, C., & Völlink, T. (2008). Cyberbullying: youngsters' experiences and parental perception. *CyberPsychology & Behavior, 11*(2), 217-23.

ISBN 978-615-5511-25-7

Towards Personalized Guidance and Support for Learning
Proceedings of the 10th European Distance and E-Learning Network Research Workshop, 2018
Barcelona, 24-26 October, 2018
ISBN 978-615-5511-25-7

UNDERSTANDING MEDIA USAGE PATTERNS OF STUDENTS AND FACULTY VIA A MEDIA ACCEPTANCE APPROACH: A CASE OF A MULTI-CAMPUS UNIVERSITY IN GHANA

Frank Senyo Loglo, Carl von Ossietzky University Oldenburg, Germany, Selorm Agbleze, Copenhagen Business School, Denmark

Abstract

The study explores media usage configurations primarily of students (n = 221) but also lecturers (n = 82) in a multi-campus university in Ghana. Constructs measured comprised the ownership and access to digital devices, the frequency of use, and the usage satisfaction of 53 media tools and services relevant for learning which were categorized as: digital devices and hardware, text media, general web tools and e-learning tools and services. Based on the responses, media acceptance was established by means of a media acceptance model. Results suggest mobile digital devices and mobile Internet, particularly cellular mobile data are ubiquitous, yet internet at homes remain scarce. Intensely used media by students and lecturers are not remarkably differentiated, however, significant differences exist between students at the main campus and satellite campuses, regarding the acceptance of some media tools. E-learning tools and services were the least accepted media, which to a large extent can be attributed to a deficit in the internet infrastructure on the campuses, however the lines that delineate the acceptance of digital devices, text media and web tools appear blurred. Preferences for external media ranked higher compared to the university's internal media offerings although they were mostly communication media. Investments in Internet technologies and infrastructure could increase the intensity in the use of e-learning tools and services, and enhance the opportunities for technology enhanced learning across all campuses.

Introduction and Purpose

An arrangement that emerged within the Ghanaian higher education (HE) landscape in response to the inequality regarding access to higher education was the introduction of multi-campus universities (MCUs). MCUs typically have campuses that are geographically separated from each other but combined in a single university system (Nicolson, 2004). Given that the categorizations for MCUs are varied in context (Pinhero & Berg, 2016), this study is concerned with MCU systems that have resulted from campus-based universities, establishing a number of satellite campuses in so-called peripheral areas to optimize life chances among people who may otherwise have been excluded (Scott, Grebrennikov, & Johnston, 2007; Pinheiro, Charles, & Jones, 2015; Pinhero & Berg, 2016); the version more prevalent in the Sub-Saharan Africa (SSA) region which has attracted recent research attention (Dhliwayo, 2014; Langa, 2017).

Similar to distance education programs, technology remains an important consideration for effective implementation of multi-campus programs (Harrison, Congdon, & DiPiro, 2010). Utilizing technology to expand access to education especially in the light of increasing demand for HE has also been argued as a viable option in SSA (Karsenti & Collin, 2012; Kashora, van der Poll, & van der Poll, 2016). Indeed, various studies have applied technology acceptance models (e.g. Davis, 1989; Venkatesh & Davis, 2000; Venkatesh, Morris, Davis, & Davis, 2003) to measure technology acceptance regarding information systems in HE globally and also within SSA (e.g. Averweg, 2008; Bere & Rambe, 2013). The strengths of these models were found to be limited to measuring the adoption potential of single media tools or services. However, a unique form of technology acceptance model known as the media acceptance model (MAM) was developed by Grosch (2011) to measure acceptance of multiple media tools and services relevant for learning and has been applied in a number of studies (e.g. Grosch, Berger, Gidion, & Romeo, 2014; Zawacki-Richter, Müskens, Krause, Alturki, & Aldraiweesh, 2015; Gerd, Capretz, Grosch, & Meadows, 2016).

In spite of the clear convergence of motives between the two streams of research – MCU and technology acceptance in HE – literature on the two have largely developed independent of each other especially in the SSA context, where challenges regarding e-learning implementation are well documented (Asunka, 2013; Conole, 2014; Gulati, 2008; Mtebe, 2015). This study attempts to bridge this gap by employing the media acceptance model (MAM) to investigate the level of acceptance regarding media tools and services relevant for learning in a multi-campus university in the SSA region. The purpose of such a study is to provide foundational understanding of possible media usage patterns on typical multi-campus universities in the SSA region with the aim of understanding current level of media acceptance for learning in complementing the education expansion drive of such universities. Insights from this study will possibly provide an exploratory understanding of the interaction effects between geographical distribution and media acceptance for the improvement of technology enhanced learning (TEL) in HE especially in the SSA context.

Research Questions

To understand the media usage patterns of undergraduate students and lecturers in a Ghanaian multi-campus university (referred to in this study as Ghana TU), the study addressed the following research questions:

- What digital tools and devices do students and lecturers of Ghana TU have access to?
- Which media tools and services do students of Ghana TU often use for academic purposes and how do these media rank in comparison to their lecturers?
- Which media tools and services do students of Ghana TU accept? What are the commonalities and differences? How does the acceptance of students relate to factors such as the campus of study (main campus versus satellite campus)?

ISBN 978-615-5511-25-7

The Research Context and Methodology

The organisational context of this study is a public Ghanaian multi-campus university college that has existed since 2006, with undergraduate and postgraduate program offerings in collaboration with local and international partners. The University College has rapidly established itself as a major multi-campus university in Ghana, by opening four satellite campuses around the country and extending its technology based education to locations further from the nation's capital. With a total student population of about 6000 and faculty strength of 153, the institution prides itself as being at the fore front of utilizing the affordances of ICT for teaching and learning since the establishment of the Centre for Online Learning and Technology (COLT) in 2012 to spearhead the implementation of online learning. Ghana TU is mainly a campus-based university, although the campuses are regionally dispersed. The university does not run any fully online programs however, close to 40% of courses are either deployed online or through blended formats for students at the main campus.

The survey adapted and utilized a fully standardized questionnaire first developed and used in 2009 at Karlsruhe Institute of Technology (KIT) in Germany (Grosch & Gidion, 2011). The questionnaire has since been administered and validated in more than 15 follow up surveys. Between the period of June 2 to 30, 2018, responses were solicited from undergraduate students and lecturers through their official emails and WhatsApp groups with several reminders. However, due to the low response of the online survey (students: 113, lecturers: 31), paper-based versions of the questionnaires were sent out to students and lecturers to complement the online survey. Liebenberg, Chetty, and Prinsloo (2012) adopted a similar approach when they found it challenging to reach a section of their respondents through an online survey. In all, total of 221 students (Male, 71.4% and Female, 28.6%) and 84 lecturers (Male, 85.4% and Female, 14.6%) across the 5 campuses completed the survey (see Table 1). More than half of the students (54.8%) and lecturers (58.5%) belonged to the Faculty of I.T Business (FoIB), while students and lecturers from the Faculty of Computing and Information Systems (FoCIS) and the Faculty of Engineering (FoE) constituted (35.7%, 29.3%) and (9.5%, 12.2%) respectively.

The survey specifically measured the usage frequency and usage satisfaction of 53 media tools and services. They included: a) Digital devices and hardware, b) Text Media, c) Internet and General Web Tools and d) E-learning tools and services which were conceptualized along the lines of Grosch and Gidion (2011) and Zawacki-Richter et al. (2015). A five point Likert scale comprising *very often* (5) to *never* (1) was used to measure usage frequency while *very useful* (5) and *not useful at all* (1) measured usage satisfaction. Media acceptance, which has a connotation of media quality, was measured by evaluating the usage frequency and usage satisfaction in the form $\{(\text{Value}_{\text{frequency of use}} + \text{Value}_{\text{usage satisfaction}})/2\}$. Due to the low sample size, the findings in this study cannot be generalized, and must therefore be interpreted with caution, however some meaningful implications can be derived for digital education within technologically challenging contexts.

ISBN 978-615-5511-25-7

Results

The overall mean age of students was 26.8, however, students in Accra (main campus) were averagely younger (24.7), compared to students from the satellite campuses (27.3). The average number of semesters completed by students was reported as 3.8. Non-traditional students, thus, students employed and therefore prefer flexible lecture session, delayed in enrolling into HE, 25 years and above (USDE, 2002) were found to be statistically significant ($p < 0.05$) among satellite campus students. Most lecturers (53.7%) were between 31 and 40 years, clearly suggesting there was no generational gap between students and lecturers. Lecturers had spent a period of (m = 3.7 years) at Ghana TU but with an overall teaching experience of (m = 6.3 years) in HE. Table 1 shows the distribution of participating students and lecturers across the various campuses of Ghana TU. As expected, participants from Accra constituted the largest share (35.7% and 43.9%) of students and lecturers respectively.

Table 1: Distribution of survey participants by campus

Category	Accra*		Ho		Koforidua		Kumasi		Takoradi		Total	
	N	%	N	%	N	%	N	%	N	%	N	%
Students	79	35.7	32	14.3	26	11.9	32	14.3	53	23.8	221	100
Lecturers	36	43.9	10	12.2	8	9.8	12	14.6	16	19.5	82	100

*Main campus

What digital tools and devices do students and lecturers of Ghana TU have access to?

As shown in Table 2, both groups are fairly equipped with digital devices and hardware. More than half (54.7%) of students own between 4 and 5 devices. While portable mobile devices such as laptops, notebooks and smartphones are extremely popular among students and their lecturers, penetration is however low regarding ownership and access to tablet computers and e-book readers (e.g. Kindle). Mobile Internet was the most accessible Internet access for students and faculty. Although lecturers had a higher access rate compared to their students, fixed broadband in homes in general, are uncommon.

Table 2: Distribution of rate of access to digital devices and hardware. Students versus Lecturers

Digital devices and Hardware	Group Category	Desktop	Printer	Laptop	Tablet	E-Book Reader	Smartphone	MP3 Player	Internet @Home	Mobile Internet
Access Rate (%)	Students (N = x)	70.3	73.8	95.2	42.5	45.0	100.0	40.5	26.1	100.0
	Lecturers (N = x)	78.1	80.5	95.1	11.8	26.8	95.1	21.9	48.8	100.0

Which media tools and services do students of Ghana TU often use for academic purposes and how do these media rank in comparison to their lecturers?

To identify which media tools and services were intensely used for academic purposes, students and lecturers were asked to rate on a scale of *very often* (5) to *never* (1), how often

ISBN 978-615-5511-25-7

they used a list of 53 media tools and services. We defined intense as media with usage frequency mean values between 3.5 and 5. Tables 3 and 4 presents the results for students and lecturers respectively. 15 media tools and services were identified to be intensely used by students with presentation slides from lecturer and students' online portal services being the only internal media offerings of the university. Compared to the ranking of their lecturers no distinct differentiation was revealed. As many as 11 out of the 15 intensely used media by students are shared in common with the lecturers.

Table 3: Ranking of intensely used media tools and services by students of Ghana TU

Media tools and services	STUDENTS				
	Type	Rank	N	M	SD
Smartphone (Android, iOS)	D	1	221	4.67	.52
Search engines (e.g. Google Search, Yahoo etc.)	W	2	221	4.52	.55
Presentation slides (from lecturer)	T	3	221	4.45	.73
Laptop/Notebook/Netbook	D	4	221	4.45	.63
Presentation software (e.g. PowerPoint, Keynote)	E	5	221	4.36	.61
Instant messaging (e.g. WhatsApp, Viber, Line)	W	6	221	4.33	.87
Word processing software (e.g. MS Word, Pages)	E	7	221	4.33	.87
Laptop/notebook on campus	D	8	221	4.24	.61
Personal Mobile Internet	D	9	221	4.17	.87
E-Books (PDFs or other formats)	T	10	221	4.12	.82
Portal for students' online services	E	11	221	4.10	1.00
Social Networks (e.g. Facebook, Twitter, Google+)	W	12	221	3.88	1.20
E-mail account (external e.g. Gmail, Hotmail)	W	13	221	3.88	.76
Spreadsheet software (e.g. MS Excel, Numbers)	E	14	221	3.86	.78
Wikipedia	W	15	221	3.71	1.08

Table 4: Ranking intensely used media tools and services by lecturers of Ghana TU

Media tools and services	LECTURERS				
	Type	Rank	N	M	SD
Use of Laptop/notebook on campus	D	1	82	4.83	.38
Search engines (e.g. Google Search, Yahoo etc.)	W	2	82	4.76	.43
Presentation software (e.g. PowerPoint, Keynote)	E	3	82	4.73	.54
Laptop/Notebook/Netbook	D	4	82	4.71	.46
E-mail account (external e.g. Gmail, Hotmail)	W	5	82	4.63	.66
E-Books (PDFs or other formats)	T	6	82	4.59	.67
Presentation slides (from lecturer)	T	7	82	4.59	.54
Word processing software (e.g. MS Word, Pages)	E	8	82	4.41	.54
Spreadsheet software (e.g. MS Excel, Numbers)	D	9	82	4.39	.77
Personal Mobile Internet	T	10	82	4.34	.93
Bibliographic software (e.g. Endnote, Mendeley)	E	11	82	3.73	.92
E-version journals	W	12	82	3.68	1.16
University created e-mail account	W	13	82	3.66	1.03
Smartphone	E	14	82	3.61	.66

ISBN 978-615-5511-25-7

Which media tools and services do students of Ghana TU? What are the commonalities and differences?

Acceptance values were computed for the 53 media tools and services along media types (see Table 5). The mean values of the frequency of use and usage satisfaction correlate ($r = 0.45$, $p < 0.01$). For devices and hardware, smartphones emerged as the most accepted device with fixed broadband internet at home recording the least acceptance value. An interesting revelation was that the acceptance value of mobile internet completely pales campus wifi acceptance as was the case of computer terminals on campus. Presentation slides from lecturers and e-books recorded the highest acceptance values within the text media category but print journals are down the pecking order of accepted text media. Handouts from within the institution are more accepted than external handouts.

External media offerings such as search engines, instant messaging and social networks (e.g. Facebook) lead the pack in terms of the highest acceptance values for general web tools and services. Similarly, wikipedia and video sharing sites (e.g. YouTube) obtained high acceptance values. However, e-mail accounts provided by the university appear non-existent compared to external e-mail services (e.g. Gmail, Yahoo Mail, etc.). Acceptance values computed for e-learning tools and services revealed office applications such as presentation, word processing and spreadsheet software as the highly accepted tools. Students online portal services for course registration and retrieval of course grades are highly accepted but not so much for internet-based learning management system.

Table 6 depicts the differences regarding highly accepted media of students at the main campus compared to students from satellite campuses. Despite recording high acceptance values in the case of the two groups, significant differences were found in the use of smartphone, mobile internet and laptop/notebook in favour of students on the main campus regarding digital devices and hardware. The use of laptop/notebook on campus was however significant among satellite campus students. Electronic text (e.g. E-books, pdf, etc.) were found to be significant among students at the main campus, just as instant messaging, video sharing and information from the university website.

Table 5: Accepted media tools and services by students

Digital Devices & Hardware	M SD	Text Media	M SD
Smartphone	4.75 .37	Presentation Slides	4.49 .56
Laptop/Notebook	4.56 .55	E-Books	4.21 .49
Laptop on campus	4.33 .55	Printed Textbook	3.55 .63
Mobile Internet	4.31 .70	Printed Handout	2.80 .79
Campus wifi	2.49 .65	(Intl)	2.70 .77
Desktop PC	2.44 .83	E-Journal	2.50 .82
Campus computer labs	2.25 .70	Printed Handout	2.43 .82
Tablet PC	2.04 .99	(Extl)	2.35 .77
E Book Reader	2.04 .84	Online Notes	
Internet at home	1.71 .59	Print Journal	
Category Mean	3.08 .27		3.11 .35

ISBN 978-615-5511-25-7

			Category Mean
General Web Tools & Serv.	M SD	E-learning Tools & Serv.	M SD
Search Engines	4.62 .41	Presentation	4.42 .48
Instant Messaging	4.45 .64	Software	4.40 .58
Social Networks	4.11 .75	Word Processing Soft.	4.17 .84
Email (External)	4.07 .58	Students Online	3.90 .55
Wikipedia	3.90 .91	Portal	3.57 .68
Video Sharing Sites	3.71 .57	Spreadsheet	2.86 .82
Online Dictionary	3.40 .79	Software	2.83 .72
Presentation Sharing Sites	3.17 .74	Learning Mgt. System	2.35 .66
Online Collaborative tool	2.95 .56	Online library	2.28 .67
File Storage and Sharing	2.81 .78	(Internal)	2.26 .77
University Website	2.52 .72	Online library	2.14 .75
Email (internal)	2.42 .52	(External)	2.06 .80
Students Response Syst.	2.12 .72	Online Comp. of	2.06 .78
Online Materials (External)	2.10 .78	course	2.01 .80
Professional Networks	1.81 .55	Learning Software	1.78 .56
Online Newsgroups	1.53 .47	Video Software	1.73 .60
		Game-based learning	1.68 .43
		Lecture Recording	1.62 .51
		Mobile apps for learning	1.02 .09
Category Mean	3.12 .33	Online Exams	2.72 .21
		Synchronous virtual class	
		Bibliographic software	
		E-Portfolio	
		Dictionary Software	
		Augmented reality apps	
		Category Mean	

Table 6: Comparison of medial tools and services with high acceptance values

Medium Type	Significantly higher acceptance among main campus students (p<0.05)	Significantly higher acceptance among satellite campus students (p<0.05)
Devices and Hardware	-Smartphone	- Laptop/Notebook use on campus
	-Mobile Internet	
	-Laptop/Notebook	
Text Media	-E-Books	
General Web Tools and Services	-Instant Messaging	
	-Video sharing sites	
	-University Website	

ISBN 978-615-5511-25-7

E-learning Tools and Services	-LMS	-Online portal services -Online library services (external)

Discussions and conclusion

Notwithstanding the challenges within the context of Ghana, students and lecturers have tremendous access to digital devices, with mobile devices such as smartphones, laptops or notebooks, the most pervasive, which is a positive signal for e-readiness. The ubiquity of mobile devices in Ghana TU reflects the trend both in SSA (e.g. Conole, 2014; Byungura, Hansson, Muparasi, & Ruhinda, 2018) and the developed countries (e.g. Zawacki-Richter et al., 2015; Grosch et al., 2014; Rodrigo et al., 2013). The key disparity between the two contexts however, was Internet at home, which recorded low acceptance values compared to the global studies where MAM was applied simply due to the fact that there is poor landline Internet connection outside the main cities. Students and lecturers preferred the use of 3G and 4G mobile internet devices through the use of dongles, mobile wifi (mifi) and hotspots compared to campus wifi. Computer labs on campus were also deemed irrelevant, since students and lecturers use personal laptops on campus frequently, possibly connected to their private mobile internet devices despite the high cost it imposes on the users. A possible reason for this occurrence could be low quality of internet service and infrastructure.

Additionally, there was a general affinity towards electronic text media (e.g. E-book, pdf) which seem to be gradually replacing printed text (e.g. Textbooks and handouts) comparable to what was found in a similar study by Zawacki-Richter et al. (2015). The explanation may be found in the intensive use of search engines, possibly for literature and information search, and the use of other communication media such as email, social networks (e.g. Facebook) and instant messaging (particularly WhatsApp) which has been found to be an easy and convenient medium for students to look for information and circulate learning materials. However, unlike in other comparable MAM studies (e.g. Grosch et al., 2014; Rodrigo et al., 2013; Zawacki-Richter et al., 2015) results in this study showed a strong preference for the use of external media offerings, both at the main campus and satellite campuses, mainly because the university's internal provision of media services was low; probably suggesting a low TEL capability maturity. The situation is likely to be more precarious in satellite campuses as low acceptance of e-learning was significant among satellite campus students. This prediction is borne out of findings by Harrison, Congdon, and DiPiro (2010) in their study of a multi-campus in an advanced country which found disparities between the main campus and other campuses regarding technology.

In general, e-learning tools and services acceptance was lowest but digital devices were as accepted as general web tools and text media for learning purposes. Since MAM explains quality from the perspective of the user (Grosch, 2011), low acceptance could be interpreted as low quality and therefore confirms the findings in studies that found service quality to be a significant factor in increasing students' satisfaction towards usage of e-learning systems (Wang & Chiu, 2011; Mohammadi, 2015). It came to light in the course of this study that the

ISBN 978-615-5511-25-7

university's internet-based learning platform (Moodle LMS) is currently not deployed to students at the satellite campuses, however, open source options such as Moodle cloud and schoology are used. This could be attributed to the personal innovativeness of the lecturers, which has an influence on the perception of usefulness as found by Lu, Yao, and Yu (2005).

The pervasiveness of digital mobile devices within this MCU case reveal a "mobile citizenry" (Mohammadi, 2015) and presents tremendous opportunities for technology enhanced learning (TEL). MCUs whose provisions are parallel on their campuses such as what pertains at Ghana TU can leverage the affordances of technology as noted in Harrison, Congdon, and DiPiro (2010). This can lead to achieving a certain degree of parity in terms of quality across campuses. This requires investments into Internet infrastructure, computer laboratories, support services etc.., since such facilitating conditions have been established to be a good predictor of the behavioural intention to adopt technology (Venkatesh et al, 2003). It is instructive that the profiles of a greater number of students found in the satellite campuses were non-traditional students, i.e. going along with USDE (2002) and Zawacki-Richter et al. (2015). This category of students is constrained by distance, time, work, and family responsibilities and are most likely to desire flexible learning approaches such as blended learning. In light of this, there is a need for the university to understand how its micro and macro context aligns with the affordances of the various e-learning media to achieve the desired success as explained in Mtebe (2015).

Overall, the application of MAM in a multi-campus university within the SSA context reveals that students at the main campus have a relatively higher acceptance of media tools and services compared to students at satellite campuses. Challenges in terms of institutional provision of internet and technological infrastructure exist and most likely accounted for the low intensity of use and acceptance of e-learning tools and services. More revelatory was also the fact that external media offering were more preferred, and the scales were tipped heavily in favour of communication media over content and collaboration media which by all indications suggests media usage is largely for information and communication purposes rather than creation or co-creation of knowledge and higher order learning activities. This study together with other studies where MAM was applied did not take into consideration the e-learning and technology enhanced learning (TEL) adoption status of the institutions as well as the main teaching profile adopted by the university. It would be worthwhile for future studies to examine media acceptance with due regards to the TEL capability maturity contexts of the institutions including the teaching styles the institutions are identified with.

References

1. Asunka, S. (2013). The viability of e-textbooks in developing countries: Ghanaian university students' perceptions. *Open Learning: The Journal of Open, Distance and e-Learning, 28*(1), 36-50.

ISBN 978-615-5511-25-7

2. Averweg, R. U. (2008). Information Technology Acceptance in South Africa: An Investigation of Perceived Usefulness, Perceived Ease of Use, and Actual System Use Constructs. *The African Journal of Information System, 1*(1).
3. Bere, A., & Rambe, P. (2013). Extending technology acceptance model in mobile learning adoption: South African University of Technology students' perspectives. *Proceedings of the International Conference on e-Learning*, 5261
4. Byungura, J., Hansson, H., Muparasi, M., & Ruhinda, B. (2018). Familiarity with Technology among First-Year Students in Rwandan Tertiary Education. *The Electronic Journal of e-Learning, 16*(1).
5. Conole, G. (2014). The use of technology in distance education. In O. Zawacki-Richter & T. Anderson (Eds.), *Online distance education: Towards a research agenda* (pp. 217-236). AU Press.
6. Davis, F. D. (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology. *MIS Quarterly, 13*(3), 319–339.
7. Dhliwayo, K. (2014). The Internal Customers Perceptions of A Multi-Campus University System in Zimbabwe. A Case of Great Zimbabwe University. *International Journal of Scientific & Technology Research, 3*(2).
8. Gerd, G., Capretz, L. F., Grosch, M., & Meadows, K. N. (2016). Trends in Students Media Usage. In *Computational Science and Its Applications – ICCSA 2016.* Springer International Publishing Switzerland.
9. Grosch, M. (2011) Designing and testing a theory model for IT systems acceptance in Tertiary Education. In P. Sandhu, & D. Delcore (Eds.), *International proceedings of PSRC* (pp. 335-338). Pattaya: Planetary Scientific Research Centre.
10. Grosch, M., Berger, R., Gidion, G., & Romeo, M. (2014). Which Media Services Do Students Use in Fact? Results of an International Empirical Survey. *Procedia – Social and Behavioral Sciences, 141*, 795 – 806.
11. Grosch, M., & Gidion, G. (2011). *Mediennutzungsgewohnheiten im Wandel.* Karlsruhe: KIT Scientific Publishing.
12. Gulati, S. (2008). Technology-enhanced learning in developing nations: A review. *The International Review of Research in Open and Distributed Learning, 9*(1).
13. Harrison, L. C., Congdon, H. B., & DiPiro, J. T. (2010). The Status of US Multi-campus Colleges and Schools of Pharmacy. *American Journal of Pharmaceutical Education, 74*(7), 124.
14. Karsenti, T., & Collin, S. (2012). Using IT for Distance Learning: Benefits and Challenges for African Learners. *Teachers & Teaching, 20*(2), 9-18. http://dx.doi.org/10.18162/fp.2012.178

ISBN 978-615-5511-25-7

15. Kashora, T., van der Poll, H. M., & van der Poll, J. A. (2016). E-learning and technologies for open distance learning in Management Accounting. *Africa Education Review, 13*(1).

16. Langa, P. (2017). A disjointed multi-campus system: the neo-liberal expansion and fragmentation of Mozambican higher education. *Tertiary Education and Management, 23*(1), 23-40. doi: 10.1080/13583883.2016.1214286

17. Liebenberg, H., Chetty, Y., & Prinsloo, P. (2012). Student Access to and Skills in Using Technology in an Open and Distance Learning Context. *International Review of Research in Open and Distance Learning, 13*(4).

18. Lu, J., Yao, J. E., & Yu, C.-S. (2005). Personal innovativeness, social influences and adoption of wireless Internet services via mobile technology. *The Journal of Strategic Information Systems, 14*(3), 245-268. doi:10.1016/j.jsis.2005.07.003

19. Mohammadi, H. (2015). Investigating users' perspectives on e-learning: An integration of TAM and IS success model. *Computers in Human Behavior, 45*, 359–374. doi:10.1016/j.chb.2014.07.044

20. Mtebe, J. S. (2015). Learning Management System success: Increasing Learning Management System usage in higher education in sub-Saharan Africa. *International Journal of Education and Development using Information and Communication Technology (IJEDICT), 11*(2), 51-64.

21. Nicolson, R. (2004). The management of multicampus systems. *South African Journal of Higher Education, 18*, 346–358

22. Pinheiro, R., & Berg, L. N. (2016). Categorizing and assessing multi-campus universities in contemporary higher education. *Tertiary Education and Management, 23*(1). doi:10.1080/13583883.2016.1205124

23. Pinheiro, R., Charles, D., & Jones, G. (2015). Equity, institutional diversity and regional development: A cross-country comparison. *Higher Education*, 1–16.

24. Rodrigo, M., Grosch, M., & Andres, J. M. (2013). Media Usage by Filipino Students – An Empirical Survey. In L.-H. e. Wong (Ed.), *Proceedings of the 21st International Conference on Computers in Education.*

25. Scott, G., Grebennikov, L., & Johnston, K. (2007). Study of Australian multi-campus universities. *Journal of Institutional Research, 13*(1), 1–23.

26. U.S. Department of Education (2002). *Nontraditional undergraduates* (NCES 2002–012). Washington, DC: U.S. Government Printing Office.

27. Venkatesh, V., & Davis, F. D. (2000). A theoretical extension of the technology acceptance model: Four longitudinal field studies. *Management Science, 46*(2), 186–204.

28. Venkatesh, V., Morris, M. G., Davis, G. B., & Davis, F. D. (2003). User acceptance of information technology: Toward a unified view. *MIS Quarterly, 27*(3), 425–478.

ISBN 978-615-5511-25-7

29. Wang, H. C., & Chiu, Y. F. (2011). Assessing e-learning 2.0 system success. *Computers & Education, 57*, 1790–1800.

30. Zawacki-Richter, O., Müskens, W., Ulrike, K., Uthman, A., & Aldraiweesh, A. (2015). Student Media Usage Patterns and Non-Traditional Learning in Higher Education. *International Review of Research in Open and Distributed Learning, 16*(2).

ISBN 978-615-5511-25-7

Towards Personalized Guidance and Support for Learning
Proceedings of the 10th European Distance and E-Learning Network Research Workshop, 2018
Barcelona, 24-26 October, 2018
ISBN 978-615-5511-25-7

SUPPORTING LEARNERS AND SOCIETAL NEEDS THROUGH EVOLUTION OF INNOVATIVE DIGITAL LEARNING ARCHITECTURES

Elsebeth Wejse Korsgaard Sorensen, Aalborg University, Denmark

Summary

This paper addresses theoretically the challenge of establishment of a networked learning architecture appropriate for the sustained design of both continuing and professional education. Bringing in theoretical concepts, together with affordances of digital technologies, and using an action research meta-methodology of critical research, the paper attempts to elucidate make transparent the type of considerations and discussions needed as a prerequisite for forming a general concept/model for pedagogic design for professional and continuing education. The study finalizes with a suggestion for a conceptual model for producing innovative learning processes within professional and continuing education.

Introduction

Today's continuing and professional education curricula focus on teaching/learning of subjects and competencies. At the same time, increasingly, they emphasize *creative* and *innovative* construction and implementation of *new knowledge*, new processes and new production:

> *"Within professional education a recent shift has taken place. Professional education has moved from specialized education and update of professional knowledge, over competence-based education, to, recently, education with goals such as creativity, innovation, intrapreneur- and entrepreneurship. OECDs Centre for Educational Research and Innovation (CERI) reveals this tendency. The core idea here is that education, in a very goal-directed way, supports initiatives, which – in turn – results in added-value to society" (Oestergaard & Sorensen, 2011; p.22)*

Learners are expected to learn *something*, *learn-to-learn*, and learn to *produce and implement the new* in their professional practices. Existing educational concepts, pedagogies and methodologies, as we know them, are not in sync with this need of our current and future society (Conole, 2013). Their loyalty is directed towards the past. They rely too heavily on "conservative thinking" in that they are almost entirely informed by and based on the knowledge society has already acquired, and not on visions of a modern society casting a glans to the future. Novel, sustainable concepts need to incorporate strategies, which not only

generally fit a modern society, but also more specifically allow data from the future to be incorporated – continuously as they emerge (Nowotny, 2006; Sorensen & Ó Murchú, 2006).

However, digital technologies, including Networked Learning, Open Educational Resources (OERs) and social software, make it possible to renew pedagogical thinking and learning designs and envision the scope of action of learners (Conole, 2013; Harlung, 2010), during their education not only as *producers of knowledge*, but also as *consumers of the same* (Helms & Agerbæk, 2010). In particular, Virtual Learning Environments (VLEs), are often characterized as having a non-hierarchical infrastructure in the communication process (Dalsgaard & Sorensen, 2008; pp.272–279). In any case, as confirmed by Dalsgaard and Sorensen (2008), the educational potential of digital technologies and environments cannot be disputed. One clear and concrete design potential of e.g. VLEs is their ability to enable and provide structure to a communicative process that transcends physical borders.

Nor can it be easily overlooked - as also noted by Sorensen and Brooks (2018) – that the ability of VLEs for facilitating communicative interactivity amongst participants, is an essential feature that invites and supports *learner empowerment* and *learner agency* – provided the learning design as well as the underlying pedagogic values and techniques are also inclusive and widening participation (Andersen et al., 2017).The possible initiatives of learners are strengthened in two ways: *Dialogic participation* and *democratic negotiation*, and *creation and sharing* of knowledge and digital resources (Sorensen & Brooks, 2017).

This paper shares these values. It is based on a view of "learning as negotiated identification", a learning concept, launched by Oestergaard and Sorensen (2011). The concept entails/comprises a learner identity as an active democratic-oriented citizen as a meta-learning output of the learning process (Sorensen, 2008) and is associated with (a) agency and communicative initiative, (b) digital dialogue and collaborative knowledge construction, (c) open educational resources (OERs).

Methodology

This methodological approach of this study is qualitative and situated within the constructivist paradigm. Building on the experience and insights from earlier research, the paper explores an identified problem that becomes elucidated through a theoretical lens – a kind of overarching theoretical umbrella, which provides a framework for the theoretical discussion and argumentation: The research framework of Skovsmose and Borba (2004).

Skovsmose and Borba

Skovsmose & Borba (2004) present a kind of action research, "participatory research", in which they incorporate a theory of "critical research that investigates alternatives". In other words, research that is directed towards hypothetical situations (in contrast to, for example, grounded theory):

ISBN 978-615-5511-25-7

> *"Critical research designates the analytical strategy aiming at investigating imagined educational situations based on studies of particular arrangement, representing the imagined situation" (Skovsmose & Borba, 2004).*

Skovsmose and Borba underlines that action research is a cyclical process, which evolves through "acting-observing-reflection-change-planning-acting" (Skovsmose & Borba, 2004; pp.8-9). Their framework (Figure 1) operates with three different situations: *current situation* (CS), *imagined situation* (IS), and *arranged situations* (AS). CS describes the status of the situation as it appeared before the initiative; IS describes a hypothetical ideal situation that provides future directions and wished intentions, and AS the situation that gets arranged with IS in mind. In between the three corners/situations (CS = *current situation*, IS = *imagined situation*, AS = *arranged situation*) of the model, the lines indicate processes (PI = *pedagogical imagination*, PO = *pedagogical organization*, CR = *critical reasoning*).

Pedagogical imagination (PI) – the key focus in a learning design – is concerned with what is captured within the dotted line in the model. What remains outside the dotted line, could potentially be the focus of a Design Based Research (DBR) project [14] with imagined situation (IS) in mind. In the present study, the research momentum is situated in critical reasoning (CR), where arranged situation (AS) is compared with IS and simultaneously viewed in the light of PI and PO that underpin the two situation.

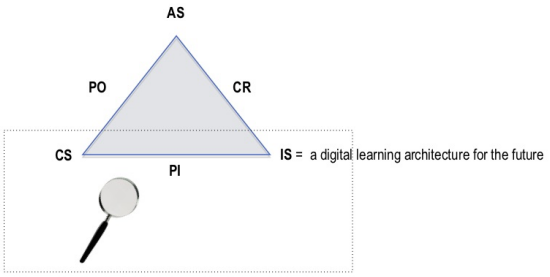


Figure 1. A model for the development of learning designs (Skovmose & Borba, 2004; p.11)

The model of Skovsmose and Borba (Figure 1) constitutes a way of structuring pedagogical development and research work. Departure is taken in the situation in question, which needs to be changed, and the implementation of the change is facilitated by incorporating the people affected by the implementation. The process of change is guided, partly by a vision, and partly by the contextual pragmatic conditions for change.

The remaining theoretical terms and concepts of the study that are chosen as a background for the discussion, underpin the author's understanding of education as something, which should be constructed and re-constructed on the basis of accompanying reflection. They are also an indication of the view that learning entails an inherent socio-cultural aspect.

This study does not address the entire model. It zooms in on the part of the model captured by the dotted line (Figure 1):

ISBN 978-615-5511-25-7

> *"Pedagogical imagination may express a historical sensitivity acknowledging what has happened in education; an anthropological sensitivity, acknowledging what else has been done in education; and a critical sensitivity which means not taking the current situation as given." (Skovsmose & Borba, 2004; p.13)*

Along the lines of the study by Oestergaard (2004) it aims to argue for the construction of a new innovative learning design model for professional and continuing education, which explores the rationale of pedagogical imagination (PI) as a pending process between the current situation (CS) and the envisioned conceptual model (IS).

Theoretical perspective

This section gives an account of some of the main theoretical concepts, views and ideas involved in building up the discussion of the suggested digital architecture (Figure 3) and its association with a view of "learning as negotiated identification" (Oestergaard & Sorensen, 2011). The idea is to generate a model for stimulating the creation of useful "prosumers" (Helms & Agerbæk, 2010) of our social society. Through processes of negotiation and sharing of creative ideas and co-creating knowledge results to form citizens that potentially may be of value to other people and to society at large (Darsoe, 2011).

More concretely, the section will present and argue theoretically for the quality and virtues of the envisioned model through views on learning design characteristics that – from a theoretical perspective – invite an engaged learning behaviour.

Agency and communicative initiative

Edwards and Mackenzie (2005) introduced the concept of *relational agency*, resting on the idea of multivoicedness [17] and [18]. The term is further applied by Sorensen and Brooks (2017) to understand online communicative behaviour. They all agree that the term to denote "working alongside others toward negotiated outcomes". This invites another route of understanding for professionals who "are given significance through their ability to work independently" (Edwards, 2011). Each professional individual or team has a social language and its own way of representing reality. Therefore, collaborating and achieving a shared understanding requires a negotiation that "involves drawing on the resources of others and being a resource for others" (Edwards & Mackenzie, 2011).

According to Edwards (2010; 2011), and further emphasized by Sorensen & Brooks (2017), two aspects of collaboration come into play, when professionals work across different individuals or teams to negotiate a goal.

> *"The first is that each individual or team holds a specific expertise, and second, they combine both their core expertise and develop a relational expertise. This expertise stems from working across individual or team boundaries and is based on engaging with the knowledge of one's specialist*

ISBN 978-615-5511-25-7

> *practice as well as the ability to identify and respond to what others offer from their local systems of expertise." (Edwards, 2011; p.33).*

In other words, boundaries create dialogic opportunities. Therefore, for relational agency to develop, an architecture for negotiation of diversity and collaborative meaning is inevitable, - that is, if collaborative learning and inclusive knowledge production across differences and professional borders are to be aimed for and facilitated.

Digital dialogue and collaborative knowledge construction

In the present perspective, *dialogue* is understood as a tool for negotiation of meaning, and *as a way of knowing*. A kind of epistemology (Sorensen, 2008), in which there are no fixed meanings to be learned. Meaning is always situated and expressed in a dialogic context, which is always open to new reflective and re-assessing comments. With reference to the insights of Bakhtin (1986), Wegerif (2006), and Edwards (2011) takes this view to the extreme when concluding that there is neither a first nor a last word, and that there are no limits at all to the dialogic context, as it extends retrospectively into the "boundless past" and ahead into the "boundless future". In essence, the requirement for supporting *meta-communicative awareness* involves the wider concept of mutuality and relational agency, with significant implications for the design of learning.

For several decades Sorensen has worked with digital dialogues and co-creation of knowledge in online learning, (e.g. Sorensen & Ó Murchú, 2006; Sorensen & Brooks, 2017; 2018). She argues that many virtual learning designs still fail, when unfolding in a virtual context, to let go on methodologies specifically inherited from face-to-face teaching/learning paradigms, many of which fail to stimulate learner-initiated democratic online interaction. This includes meta-interaction, a vehicle for supporting awareness, and it includes the birth of innovative learning. With the obtained insight and practical experience from many years of practical use and research studies, Sorensen and O Murchú (2006) presented a learning model for co-construction of knowledge *through learner dialogue and meta-learning,* focusing essentially on learning and collaborative knowledge building through online digital dialogue, distinguishing involved interaction (learners-learners and teachers-learners), and reflective meta-interaction (teacher-learners and learners-learners) (Sorensen & Ó Murchú, 2006; p.235).

The model (Figure 2) produced the concept of "dialogic tapestries" and operates with a multimodal and very wide and diverse concept of resources [4], and the use of it continuously spawned new investigations, insights and resources. The latter may be of any kind of nature, ranging from traditional literature and readings of research papers, pieces of software, personal/mutual experience, and expert knowledge, to "meta-resources" like, e.g. previous dialogue and other plays of learning. This wide resource concept adds to the openness of the model. Minimizing the determination of the script of the play of learning (the predicted frame of the future process), it leaves the actors with a freedom to establish ownership, to improvise, and thereby excerpt influence in a meaningful collaborative knowledge building (CKB) process (the actual situated unfolding process). In principle, any type of resource that

ISBN 978-615-5511-25-7

enhances the CKB process may be identified and pulled into the discussion and meta-discussions by the participants. Teacher and learner roles are equalled out and subverted dynamically. The strongest collaborative energy of a learning group manifests itself in the "Now" (Sorensen & Ó Murchú, 2006).

Through more than a decade, this model has been successfully implemented in practice contexts of Master programmes in higher education in both Denmark and Ireland. The model has generated not only extensive data through educational practice (see e.g. Sorensen & Brooks, 2017), but has over the years also given birth to several scientific papers, the latest being Sorensen and Brooks (2018). Moreover, further research has explored digital learning dialogues, using Wittgenstein's Language Game theory (Sorensen & Ò Murchú, 2006).

Acknowledging the accumulated insights from both theory and practice on digital dialogues for learning of Sorensen and Ó Murchú (2006) and Wegerif (2006), as well as the work of Darsoe (2011) on innovation and learning designs for the emerging future, it makes sense to take these insights one step further and develop a learning architecture, which not only incorporates empowering learner dialogue and interaction, but actually puts an essential focus on the facilitation "of the collaborative and dialogic co-construction of NEW knowledge together with others".

Open Educational Resources (OERs)

The OER movement originated from developments in open and distance learning (ODL) and in the wider context of a culture of open knowledge, open source, free sharing and peer collaboration, which emerged in the late 20th century (The word *open* has physical, psychological, narrative, and moral or value related implications. Openness also refers to various states of mind, including not having a secret agenda; being open to more angles, methods or theories; willingness to accept more than one possible conclusion and so forth. In respect of OER there is no doubt of the o*pen* term meaning *free*). A too tight definition of OER would exclude a large numbers of content representations that may still have been perceived, and/or used as OER
(Wikipedia: https://en.wikipedia.org/wiki/Open_educational_resources#cite_note-expert-meeting-17).

Open implies the idea of inclusiveness and that the content is completely accessible, easy to find, visible for the public and useful for somebody. The content can eventually be changed or reconfigured by the user(s). OER information and/or tasks can stand alone – that is to say, content which has been made for one context may potentially be used in a new context.

Educational suggests that one can learn something new at a qualitative formal level, which is different from knowledge sharing, peer-to-peer learning, or apprenticeship learning, implying that education is something that happens when one or more educated persons (with formal qualifications on a subject) teach their knowledge or skills on the subject. OER then refers to content that is formally qualified, and the content is meant as a possible help for learning the

ISBN 978-615-5511-25-7

subject or topic in question. This content may be purely informational, training or exercises, self-tests or simulations, or it may be combinations of two or more of the above.

OERs may be viewed in a knowledge generating perspective in relation to learners' recitation, knowledge sharing, knowledge selection, knowledge arrangement and, not least, meaning-making. But more importantly in relation to learning as a construction process and resources for knowledge sharing, see Harlung (2010).

Learners may thus be characterized as both *consumers* of knowledge and *producers* of knowledge, the so-called "prosumers" (Helms & Agerbaek, 2010). These prosumers may thus incorporate OERs in order to produce new knowledge, but may also be seen as innovative producers of OERs. From this point of view there is an expectation to learners in professional and continuing education to learn something, to learn-to-learn (Bateson, 1976) to produce something new, and implement the new in their professional practices.

In a learning architecture for a sustainable future it makes sense to incorporate mechanisms of "openness", not only in terms of access to resources of all kinds, but also when we are aiming at a sustainable and yet innovative learning architecture prepared for the unforeseen future:

- Openness to the new. When learning processes are unpredictable it is not possible to know in advance which resources are relevant. This means that access to open and flexible learning resources is necessary in other to create, participate and reify the learning process.
- Openness in relation to the surrounding society, with a possibility for engaging in actual authentic dialogue and in order to align set of values and strategies.
- Openness in order to continuously be in contact with various human networks.
- Openness provides opportunity for timing and intervention
- Openness within and outside the formal learning community invites inter- and transdisciplinarity.

Summing up, the author has argued for the importance of the three areas elucidated, "agency and communicative initiative", "digital dialogue and collaborative knowledge construction", and "open educational resources". They are all pertinent ingredients, of a learning design model and architecture in an innovative professional and continuing education design context. The model that the author proposes, incorporates the idea of "being innovative in relation to the future, while moving into the future". The model is outlined and presented in the next section.

A sustainable empowering democratic learning architecture for the future (SLAF

The Sustainable empowering democratic Learning architecture for the Future (SLAF) model constitutes an attractive concept.

ISBN 978-615-5511-25-7

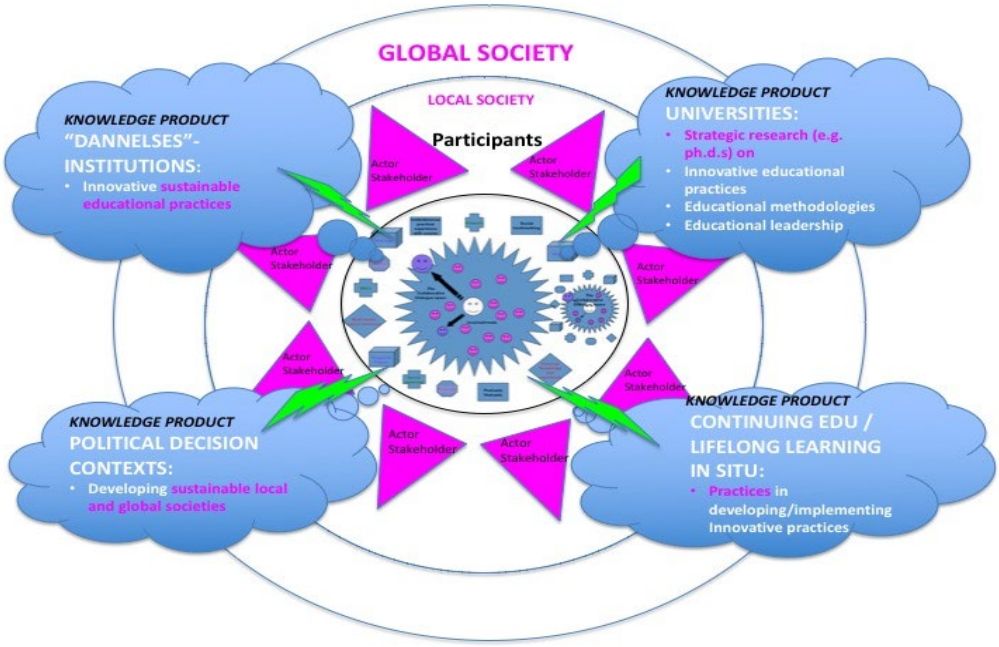


Figure 2. The SLAF model. Innovative learning and collaborative knowledge building across positions and disciplines. Innovation and data generation in situ.

The envisioned SLAF learning and negotiation model (Figure 2) integrates the successful net-based dialogical model for collaborative knowledge building from Figure 2. SLAF then becomes a communicative melting pot, in which all stakeholders – across hierarchical positions and disciplines – in a "modus 2" setting (Nowotny, 2006) participate, create and innovate in a collaborative knowledge building process without walls. All participants (including researchers) are both contributors (provide input) and learners (gaining output). Everyone involved (i.e. perspectives and areas of the various knowledge areas represented), may be characterized as "prosumers" (Helms & Agerbaek, 2010). All stakeholders from the four main areas of society (Figure 2) contribute as *input* their insights and expertise to the collaborative work and negotiated identification/learning process, and likewise every stakeholder takes away, as *output* from the collaborative learning and negotiation process, exactly that which makes sense to him/her and is useful from his/her individual position and perspective. In the wording of Edwards (2007):

> *"(…) boundaries as spaces where the resources from different practices are brought together to expand interpretations of multifaceted tasks, and not as barriers between the knowledge and motives that characterize specialist practices. Importantly, the learning that occurs in these spaces is not a matter of learning how to do the work of others, but involves gaining sufficient insight into purposes and practices of others to enable collaboration." (Edwards, 2007; p.34)*

ISBN 978-615-5511-25-7

Conclusion

This paper has addressed the challenge of establishing a networked learning design or architecture appropriate for the sustained design of both continuing and professional education. Bringing in theoretical concepts, together with the affordances of digital technologies, and using an action research methodology of critical research in a meta-perspective the paper has attempted to elucidate the type of considerations and discussions needed as a prerequisite for forming a general concept/model for pedagogic design for professional and continuing education.

In a wider perspective the architecture may serve as a model for associating education with research in a way that ensure research-based teaching and learning. The two contexts share the same need for being able to work in environments for connecting and engaging in dialogue and collaboration across diverse professional contexts. This invites the interactive, inter-connective, collaborative, and reflective potential of digital technology – for creating the social networks (open to the data, processes and products of the future) and for reifying a genuine innovative collaborative process, suited and sustained for the unknown future.

Acknowledging that dialogic teaching tends to draw learners into an epistemological process of shared knowledge construction, this means that the primary objective in a context of digital collaborative knowledge building dialogue must be to engage participants in sustained stretches of talk. Doing so enables speakers and listeners (participants) to explore and build on their own and others' ideas – in the course of, not re-producing, but collaboratively holding different ideas together in the tension of a dialogue, while producing NEW insight - and potentially, through this ontological focus, change our reality.

References

1. Andersen, H. V., Sorensen, E. K., de Lopez, K. J., & Jensen, R. H. S. (Eds.) (2017). *It-baseret inklusion af elever med udviklings- og opmærksomhedsproblemer i folkeskolen.* Aalborg: Aalborg Universitetsforlag.
2. Bakhtin, M. M. (1986). *Speech genres and other late essays.* Austin: University of Texas.
3. Barab, S., & Squire, K. (2004). Design Based Research: Putting a Stake in the Ground. *The Journal of the Learning Sciences, 13*(1), 1–14.
4. Bateson, G. (1976). *Steps to an ecology of mind: collected essays in anthropology, psychiatry, evolution, and epistemology.* Chicago, Ill. Chichester: University of Chicago Press.
5. Conole, G. (2013). *Designing for learning in an Open World.* New York: Springer.
6. Dalsgaard, C., & Sorensen, E. K. (2008). *A typology for Web 2.0.* ECEL.
7. Dalsgaard, C. N. (2010). Internettet som personaliseret og social medie. *Læring & Medier (LOM), 5*. ISSN: 1903-248X

ISBN 978-615-5511-25-7

8. Darsø, L. (2011). *Innovationspædagogik: kunsten at fremelske innovationskompetence.* Frederiksberg: Samfundslitteratur.
9. Edwards, A. (2005). *Cultural Historical Activity Theory and Learning: a relational turn.* TLRP Annual Conference Keynote Address, University of Warwick.
10. Edwards, A. (2007). Relational Agency in Professional Practice: A CHAT Analysis. *An International Journal of Human Activity Theory, 1*, 1-17
11. Edwards, A. (2010). *Being an Expert Practitioner: the relational turn in expertise.* London, New York: Springer.
12. Edwards, A. (2011). Building common knowledge at the boundaries between professional practices: Relational Agency and relational expertise in systems of distributed expertise. *International Journal of Educational Research, 50*, 33-39.
13. Edwards, A., & Mackenzie, L. (2005). Steps towards participation: the social support of learning trajectories. *International Journal of Lifelong Education, 24*(4), 287-302.
14. Harlung, A. H. (2010). *Open Educational Resources in Denmark. Status report 2010.* Center for IT and Learning, Aarhus University, Denmark.
15. Helms, N. H., & Agerbæk, L. (2010). *Nettets læringstopografi. Et anslag til didaktisk kortlægning af metaverse, i Onedge 2_10.* Knowledge Lab, University of Southern Denmark.
16. Nowotny, H. (2006). *Cultures of technology and the quest for innovation.* New York, New York: Berghahn Books. ISBN 9781845451172
17. Oestergaard, R. (2004). *Master thesis: Professionsuddannelse i et fremtidsperspektiv. Brobygning mellem teori og praksis i fysioterapeutuddannelsen.* Aalborg Universitet.
18. Oestergaard, R., & Sorensen, E. K. (2011). Networked Learning as a Process of Identification in the Intersection of Collaborative Knowledge Building. Fostering Creativity, Awareness and Re-Use of OER. *Proceedings of the European Conference for Open and Distance E-Learning, EDEN 2011*, 22-26. Held at the University College Dublin (UCD), June 19-22, 2011.
19. Skovsmose, O., & Borba, B. (2004). Research Methodology and Critical Mathematics Education. *Researching the Socio-political Dimensions of Mathematics Education: Issues of Power in Theory and Methodology, 2004*, 207–226.
20. Sorensen, E. K (2008). Design of dialogic eLearning-to-learn: metalearning as pedagogical methodology. *International Journal of Web Based Communities, 4*(2), 244-252.
21. Sorensen E. K., & Brooks, E. I. (2017). Designing Inclusive Reflective Learning with Digital Democratic Dialogue Across Boundaries and Diversities. *Proceedings of the Design, Learning and Innovation (DLI) conference.* Heraklion, Crete, Greece, October 30-31, 2017.

ISBN 978-615-5511-25-7

22. Sorensen, E. K., & Brooks, E. I. (2018). *Promoting agency and identity building in dialogic learning communities online.* Submitted for the Networked Learning conference to be held in Zagreb, Croatia, May 14-16, 2018.

23. Sorensen, E. K., & Ó Murchú, D. (2006). Identifying an Appropriate, Pedagogical, Networked Architecture for Online Learning Communities within Higher and Continuing Education. In E. K. Sorensen & D. Ó Murchú (Eds.), *Enhancing Learning Through Technology* (pp. 226-251). Hershey, PA: Idea Group Inc.

24. Wegerif, R. (2006). Dialogic Education: what is it and why do we need it? *Education Review, 19*(2), 58-67.

25. Wegerif, R. (2016). Applying dialogic theory to illuminate the relationship between literacy education and teaching thinking in the context of the Internet Age. Contribution to a special issue on International Perspectives on Dialogic Theory and Practice. In S. Brindley, M. Juzwik, & A. Whitehurst (Eds.), *L1-Educational Studies in Language and Literature, 16* (pp. 1-21). http://dx.doi.org/10.17239/L1ESLL-2016.16.02.07

Acknowledgment

Thanks to the course participants of the MIL MS program and to the education for ILOO students, as well as to the course informants. This paper constitutes a short version of another longer version dealing with the problem.

ISBN 978-615-5511-25-7

Towards Personalized Guidance and Support for Learning
Proceedings of the 10th European Distance and E-Learning Network Research Workshop, 2018
Barcelona, 24-26 October, 2018
ISBN 978-615-5511-25-7

INSTITUTIONAL SUPPORT TO PROVIDE FRESHMEN WITH FLEXIBLE LEARNING PATHS AT COURSE AND SEMESTER LEVEL IN OPEN HIGHER EDUCATION

Loles González, eLearn Center (eLC) / Universitat Oberta de Catalunya (UOC), Julià Minguillón, UOC, Josep Antoni Martínez-Aceituno, eLC / UOC, Julio Meneses, UOC, Spain

Summary

As an open university, at UOC there are nearly no enrolment requirements and, furthermore, students freely choose the courses they want to take each semester. But most of the students that choose UOC to combine their daily live with university studies are not really aware about the effort and workload implied. Therefore, there is a significant dropout rate after finalizing their first semester. In this paper we describe an institutional project named ESPRIA that combines the use of institutional learning analytics and the work with teachers at course design level, in order to provide students with some personalized support during their first enrolment. This guidance may help them to avoid an excessive burden due to a wrong course election, to gauge and meet their expectations by achieving their goals at the end of their first semester, and to be motivated to re-enrol in the following ones.

Introduction

Trying to answer "what are open universities for?", Alan Tait states that open universities "are for development, not just for teaching and research, nor even for adult higher education at a distance." Among their purposes, Tait (2008) emphasizes on "intervention to change the higher education system in terms of quality and innovation" (p.92), mostly by adopting ICT and offering online learning. Butcher and Rose-Adams (2015) discuss three key factors that allegedly define open universities, namely the possibility of choice, flexibility and employability, which need to be fully redefined to meet part-time students' needs. Actually, flexibility may have different meanings according to each university. Among others, "open" means that there are no enrolment requirements that they are very weak, or that they are related to course calendar. In the case of the Universitat Oberta de Catalunya (UOC), *open* means, among others, that students freely choose the courses they want to take every semester under the guidance of a mentor, who provides non-bonding recommendations, a typical scenario in open higher education.

The number of different enrolment patterns among newcomers is surprisingly very high, despite mentor's recommendations and all the available information about course syllabus and learning paths provided by the University. This shows the large diversity of part-time students' interests. For instance, in the second semester of academic year 2016/2017, a total of

4,243 new students started an official graduate degree, generating 2,193 different enrolment patterns. From these, 1,667 (76.0%) were unique (that is, selected by only one student). On the other hand, 90 (0.02%) students selected the same combination of courses (i.e. the most popular in one degree) as their first enrolment. This flexibility may be perceived by some students as an additional barrier to determine the best courses they should take during their first semester, due to the large number of possible combinations and the lack of information about their difficulty when taken at the same time. Furthermore, institutional data shows that a wrong choice of courses taken in the first semester may lead to dropout, not only from a given course but also from the degree (Minguillón, Santanach, & Appel, 2016). Unfortunately, each course is a silo that has been carefully designed according to UOC's pedagogical model but without taking into account other courses in the same program, generating possible interactions that can only be analysed *a posteriori* using a learning analytics strategy.

According to 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." (p.1). Dropout is one of the scenarios where learning analytics can be applied. It is a multifaceted problem, which needs to be addressed from several perspectives following an institutional a multilevel approach (Mor, Garreta-Domingo, Minguillón, & Lewis, 2007), using all information available about the learner. In this paper we describe the ongoing institutional project "First-year Students" ESPRIA (for its initials in Catalan) that uses institutional learning analytics (Minguillón, Santanach, & Appel, 2016) for providing freshmen with some personalized support during their first enrolment in their first academic semester, pursuing academic flexibility as well as improving overall course quality.

Early dropout in online higher education

A recent survey on educational data mining (Peña-Ayala, 2014) shows that there has been an increasing interest in recommendation systems at course and to minor extent in semester levels, boosted by students' data availability. More recently, Slim, Heileman, Al-Doroubi, and Abdallah (2016) have shown that course enrolment has a large impact on final student's achievements and engagement in both course and semester levels. As stated in Ognjanovic, Gasevic, and Dawson (2016), self-efficacy and efficacy expectations are well established as strong predictors of academic achievement and, conversely, dropout, especially in educational settings where students have partial or even complete freedom to select the courses they want to enrol in.

It is well known that dropout levels in distance education are usually higher than in its traditional face-to-face counterpart (Tello, 2007). It can be seen that, in both models, academic and social integration at the early stages of the relation student-institution are key issues. Lee and Choi (2011) identified and classified student, environmental, and course/program factors in online learning, being the latter the target of institutional policies against dropout, including course design and institutional support. In a recent literature

ISBN 978-615-5511-25-7

review by Bawa (2016), the author enumerates several critical factors that lead to high attrition rates in online environments. One of them is the misconceptions learners have about the workload, cognitive challenges, and general expectations, which may lead to a wrong selection of courses for the first semester.

In the case of open universities, where students can take a break one or more consecutive semesters, Grau-Valldosera, Minguillón, and Blasco-Moreno (2018) have shown that doing so after the first semester is, in practical terms, equivalent to dropping out. Nevertheless, the authors have also identified several factors that differentiate between continuance intention and effective re-enrolment (i.e., not dropping out). Among them, time management during the first semester emerges as a key issue, as most students choose UOC to save time. However, a negative perception on the amount of time needed to properly follow the semester is one of the factors for no further re-enrolment. Therefore, any institutional support should address balancing students' expectations and goals during their enrolment (i.e. their selection of courses) with previous knowledge about academic results, as well as providing students with some flexibility during their first academic semester to face unexpected situations. As Rodríguez-Gómez, Meneses, Gairín, Feixas, and Muñoz (2016) showed, first enrolment is also a key issue in brick-and-mortar universities, taking into account that most students returned to the university system in the first year after dropout, but many of these students change to a different area of knowledge, which is clear evidence of dysfunctional and inefficient guidance systems during university entrance.

Providing first-year students with institutional support

The UOC is an innovative university that is rooted in Catalonia and open to the world. It offers people lifelong learning to help them and society advance, while carrying out research on the Knowledge Society. Its educational model is based on accompanying students using e-learning (Sangrà, 2002). Continuous evaluation is used to guide students through each course, by means of both formative and summative assessment. Actually, successful adherence to continuous evaluation is the best proxy for re-enrolment and vice versa. Hence, students not following the proposed continuous assessment activities are most likely to drop out. Therefore, continuous evaluation is a crucial element in UOC's educational model, which needs to be embraced by new students. It is important to state that UOC's student profile is typically 32 years old on average; she has prior university education, has a part-time or full-time job, and, usually, has family responsibilities.

In this sense, the ESPRIA project is aimed to face three typical situations faced by newcomers in their first semester, namely taking several courses with possibly overlapping schedules, reshaping their learning path if they cannot follow the proposed continuous assessment activities, and assuming an excessive burden due to a wrong course election. The main goal of ESPRIA is helping students to adhere to continuous assessment, providing them with flexible enrolment packages (i.e. subsets of courses), which have non-overlapping calendars, a revised course syllabus and workload, as well as additional or alternative opportunities to follow

ISBN 978-615-5511-25-7

continuous assessment in case the student misses one of the proposed activities. Packages have been designed in collaboration with professors taking into account previous data, namely typical enrolment patterns and course pass rates (Minguillón, Santanach, & Appel, 2016). Moreover, to create the packages in the involved graduate degrees we selected courses according to students' interests. Each package (typically containing 3 courses) is a possible learning path (at semester level) that tries to minimize the aforementioned typical situations. Recommending packages increases freedom of choice while improving flexibility, because it guarantees the aforementioned benefits to the enrolled students. Each degree offers 3 packages and the students have flexibility to choose any package and the number of courses within the package they are interested in, taking into account that UOC's typical enrolment is 2 or 3 courses.

First semester students undergo an enrolment procedure where they are guided by a mentor, who helps them to select the courses they will take in their first semester, according to their profile and interests. As part of this procedure, new comers are invited to provide additional information by means of a survey (AQD) that contains questions about their available time for studying. According to this information and students' preferences, their mentors provide a recommendation, based on the pre-designed packages or a subset of courses within the same package. The project has been designed to guide the students through their first academic year but placing more emphasis on the first semester. We expect students participating in ESPRIA to repeat the same enrolment procedure in their second semester, taking into account their actual academic results in their first semester.

To conclude, this project has been designed and implemented by the eLearn Center in coordination with degree managers, teachers, and mentors, providing them with advise and support to achieve ESPRIA objectives.

Results

In its first semester of deployment, ESPRIA has been implemented in six different graduate degrees (Business, Administration and Management, Law, Computer Engineering, Catalan Language and Literature, Communication Sciences, and Social Education), involving 51 different courses, 45 full-time teachers, 140 mentors, and 253 part-time teachers. A total of 1,647 students enrolled in their first semester in February 2018 in one of these degrees (representing the 41.6% of all new UOC students taking an official graduate degree), thus becoming potential ESPRIA participants. These figures show the importance of ESPRIA as part of UOC's strategy to improve students' support and fight early dropout while providing flexibility in their choices.

Table 1: Summary of participants in the ESPRIA project.

	ESPRIA N (%)	ESPRIA + OTHER N (%)	NON ESPRIA N (%)	TOTAL N
BUSINESS ADMINISTRATION AND MANAGEMENT	216 (51.18%)	142 (33.65%)	64 (15.17%)	422

ISBN 978-615-5511-25-7

LAW	185 (47.19%)	103 (26.28%)	104 (26.53%)	392
COMPUTER ENGINEERING	205 (48.93%)	149 (35.56%)	65 (15.51%)	419
CATALAN LANGUAGE AND LITERATURE	9 (25.00%)	20 (55.56%)	7 (19.44%)	36
COMMUNICATION SCIENCES	61 (40.40%)	63 (41.72%)	27 (17.88%)	151
SOCIAL EDUCATION	174 (76.65%)	38 (16.74%)	15 (6.61%)	227
TOTAL	850 (51.61%)	515 (31.27%)	281 (17.12%)	1,647

Table 1 summarizes the number of students participating in the ESPRIA project according to their choice of courses in each degree. Notice that most of students take only courses within ESPRIA (51.61%), while only a minority of students chooses a combination of courses that are not part of ESPRIA (17.12%).

Discussion

As an ongoing project in its first stage (i.e. first cohort of students enrolling in accordance to the proposed enrolment packages of courses in each degree), ESPRIA will be fully evaluated in the following years, in order to determine its impact on freshmen, their academic performance and satisfaction, and their re-enrolment rate at their second semester. Nevertheless, several conclusions can be already drawn from this first semester of deployment.

Not surprisingly, the critical factors that emerged in this phase were those related to organizational changes. For instance, some teachers were reluctant to revise course syllabus and workload as well as coordinating course schedule with other teachers, breaking the traditional "siloed" way of designing courses at UOC. Another important issue was training a high number of mentors and providing them with support and new tools to supervise the new enrolment process involving packages. In order to make mentors' tasks easier, a web app with a friendly interface was developed according to their informed needs and preferences. This application helps mentors to check and look up information about each student and the courses / packages they have select, gathering also relevant information about the enrolment procedure (i.e. available time for studying). Nonetheless, preliminary results show that a large percentage of students (51.61%) chose to follow their mentors' recommendations and finally enrolled only in specific courses / packages that were revised under the ESPRIA framework.

Current and future research in this topic includes analysing ESPRIA success with respect to continuous evaluation and effective re-enrolment of both participating and non-participating students and their level of engagement. On the other hand, more programs and courses will be part of ESPRIA in the next semesters, so more data about students and their course selections in a wider selection of graduate degrees will be available. Finally, all available data from ESPRIA could be also analysed in order to measure the idoneity of the proposed packages within each degree, trying to detect possible bottlenecks and improving enrolment in further recommendations.

ISBN 978-615-5511-25-7

References

1. Bawa, P. (2016). Retention in online courses: Exploring issues and solutions – A literature review. *Sage Open, 6*(1), 1-11. doi:10.1177/2158244015621777
2. Butcher, J., & Rose-Adams, J. (2015). Part-time learners in open and distance learning: Revisiting the critical importance of choice, flexibility and employability. *Open Learning: The Journal of Open, Distance and e-Learning, 30*(2), 127-137. doi:10.1080/02680513.2015.1055719
3. Grau-Valldosera, J., Minguillón, J., & Blasco-Moreno, A. (2018). Returning after taking a break in online distance higher education: From intention to effective re-enrolment. *Interactive Learning Environments, In press*. doi:10.1080/10494820.2018.1470986
4. Lee, Y., & Choi, J. (2011). A review of online course dropout research: Implications for practice and future research. *Educational Technology Research and Development, 59*(5), 593-618. doi:10.1007/s11423-010-9177-y
5. Minguillón, J., Santanach, F., & Appel, M. C. (2016). *Using learning analytics to support applied research and innovation in higher education.* Paper presented at the 8th EDEN Research Workshop, Oxford, United Kingdom.
6. Mor, E., Garreta-Domingo, M., Minguillón, J., & Lewis, S. (2007). A three-level approach for analyzing user behavior in ongoing relationships. In J.A. Jacko (Ed.), *International Conference on Human-Computer Interaction* (pp. 971-980). Berlin: Springer.
7. Ognjanovic, I., Gasevic, D., & Dawson, S. (2016). Using institutional data to predict student course selections in higher education. *The Internet and Higher Education, 29*, 49-62. doi:10.1016/j.iheduc.2015.12.002
8. Peña-Ayala, A. (2014). Educational data mining: A survey and a data mining-based analysis of recent works. *Expert systems with applications, 41*(4), 1432-1462. doi:10.1016/j.eswa.2013.08.042
9. Rodríguez-Gómez, D., Meneses, J., Gairín, J., Feixas, M., & Muñoz, J. L. (2016). They have gone, and now what? Understanding re-enrolment patterns in the Catalan public higher education system. *Higher Education Research Development, 35*(4), 815–828. doi:10.1080/07294360.2015.1137886
10. Sangrà, A. (2002). A new learning model for the information and knowledge society: The case of the Universitat Oberta de Catalunya (UOC), Spain. *The International Review of Research in Open and Distributed Learning, 2*(2), 1-19. Retrieved from http://www.irrodl.org/index.php/irrodl/article/view/55/114
11. Siemens, G., & Gasevic, D. (2012). Guest editorial – Learning and knowledge analytics. *Educational Technology & Society, 15*(3), 1-2.
12. Slim, A., Heileman, G. L., Al-Doroubi, W., & Abdallah, C. T. (2016, March). *The impact of course enrolment sequences on student success.* Proceedings of the 30th International

ISBN 978-615-5511-25-7

Conference on Advanced Information Networking and Applications, Crans-Montana, Switzerland. doi:10.1109/AINA.2016.140

13. Tait, A. (2008). What are open universities for? *Open Learning: The Journal of Open, Distance and e-Learning, 23*(2), 85-93. doi: 10.1080/02680510802051871
14. Tello, S. (2007). An analysis of student persistence in online education. International *Journal of Information and Communication Technology Education, 3*(3), 47-62. doi:10.4018/jicte.2007070105

ISBN 978-615-5511-25-7

Towards Personalized Guidance and Support for Learning
Proceedings of the 10th European Distance and E-Learning Network Research Workshop, 2018
Barcelona, 24-26 October, 2018
ISBN 978-615-5511-25-7

MEANINGFUL GAMIFICATION IN A COLLABORATIVE LEARNING HUB FOR VIRTUAL MOBILITY SKILLS: RESEARCH AND DESIGN

Ilona Buchem, Beuth University of Applied Sciences Berlin, Germany

Summary

This poster presents research and design considerations for meaningful gamification in the collaborative learning hub for virtual mobility skills developed in the Erasmus+ strategic partnership Open Virtual Mobility (OpenVM).

Introduction

The project Open Virtual Mobility (OpenVM, 2017-2020) is a strategic partnership for innovation and the exchange of good practices in higher education. The project aims at enhancing the uptake of virtual mobility in higher education in Europe by improving virtual mobility skills and in consequence readiness for implementation and participation in virtual mobility programs and actions. Virtual mobility is a relatively new concept promoted by the European Union to enhance intercultural experiences of educators and students. However, the concept and the possibilities of virtual mobility are still unknown to a large population of educators and students in Europe (Dauksiene et al., 2010). Virtual mobility can take different forms, e. g. joint virtual seminars, virtual exchanges, virtual internships or placements, virtual campuses or virtual support activities for physical mobility before, during and after physical mobility. Some of the key challenges to a wider-scale implementation of virtual mobility in higher education in Europe include lack of knowledge and/or lack of consensus about the concept of virtual mobility, scarcity of information about good practice examples, applicable scenarios, implementation guidelines as well as lack of experience in recognising skills acquired through virtual mobility activities (Dauksiene et al., 2010).

The project Open Virtual Mobility addresses these challenges. One of the key aims is to design a collaborative Learning Hub for achievement, assessment and recognition of virtual mobility skills. The OpenVM Learning Hub is envisaged to provide educators and students the ample opportunities to learn about forms and examples of virtual mobility, learn in teams and collaborate on designing joint virtual mobility activities as well as use different forms of e-assessment (e. g. evidence-based, test-based) to assess own virtual mobility skills and get these skills recognised with open credentials based on the Mozilla Open Badges metadata standard. The project has been developing a set of tools, methods and guidelines to enhance achievement, assessment and recognition of virtual mobility skills, such as intercultural skills, digital skills, collaborative and networking skills.

Meaningful Gamification

The OpenVM Learning Hub aims to create engaging and effective learner experience through diverse, collaborative learning activities making use of gamification as an approach to enhancing collaborative learning for the development of virtual mobility skills. Gamification means using game elements in non-game contexts (Deterding, 2011). The OpenVM Learning Hub design approach builds on the concept of meaningful gamification, and focuses on helping learners find meaning in each underlying learning activity (Nicholson, 2012).

The meaningful gamification approach is different to gamification approaches which provide meaningless awards which may distract or even discourage learners from engaging in further activities. Studies, such as the meta-analysis by Deci et al. (2001) show that most forms of external rewards tend to reduce internal motivation. Some of the key challenges of scoring-based gamification approaches are:

- limited possibilities for an individual to make choices without external influence or control (which may have negative effects on self-determination and self-regulation),
- the necessity to keep the user in the reward loop all the time (which may have negative effects on learner autonomy as it never frees the learner from the external control of the scoring system), and
- enhancing negative effects through the lack of progress or weak scores compared to other users.

Meaningful gamification applied in the design of the OpenVM Learning Hub aims to avoid the pitfalls of score-based gamification approaches and focuses on allowing users to self-identify with the goals of activities by facilitating the understanding of the importance of an activity and helping users integrate the goals of activities with personal goals. Following the recommendations by (Nicholson, 2012), the concept of meaningful gamification applied to the design of the OpenVM Learning Hub aims at enhancing learner autonomy though self-directed learning and providing meaningful choices of opportunities for learning.

The key approach is to involve the learner in the creation and/or customisation of the learning goals, learning content/materials and learning activities so that the goals, content and activities can become relevant to the background, interests and needs of a given learner. The key target groups of OpenVM Learning Hub are educators and students in higher education, but also international officers, companies providing or wishing to provide virtual placements/internships as well as higher education leaders. Given this diversity of the target group enhanced by the diversity of academic disciplines and field of study as well as national/cultural backgrounds, the challenge in designing a gamified collaborative learning hub lies in creating meaningful learning experiences.

Meaningful Gamification Research

The meaningful gamification design of the OpenVM Learning Hub is driven by the theory of Universal Design for Learning (UDL), which guides the design of meaningful learning

ISBN 978-615-5511-25-7

experiences that are appropriate for a diverse group of learners (Rose & Meyer, 2002). Using UDL principles allows to design for diverse needs and interests of learners. The following strategies are recommended by (Rose & Meyer, 2002):

- presenting content in different ways (the *what* of learning),
- providing different activities for the learner (the *how* of learning), and
- allowing different paths to achieve goals and to make meaningful connections (the *why* of learning).

The WHY, WHAT and HOW of learning as proposed by the Universal Design for Learning mean in detail:

- WHY: The *why* of learning is about providing multiple options for engagement and takes into consideration different types of characteristics of the learner which influence engagement such as culture, personal relevance, subjectivity, and background knowledge.
- WHAT: The *what* of learning is about providing options for representation of content and information and takes into consideration the differ ways learners perceive and comprehend information such as language or cultural differences and media preferences.
- HOW: The *how* of learning is about providing options for action and expression and takes into consideration differences in which learners prefer to navigate a learning environment and express themselves which may be influenced by individual characteristics such as strategic and organisational abilities, language and preferred forms of expression (e. g. text, speech, video)."

The WHAT, HOW and WHY of learning within the Universal Design for Learning (UDL) framework includes an extensive set of learning design considerations which can be mixed and matched according to specific learning contexts and learning goals (http://udlguidelines.cast.org/more/about-graphic-organizer).

In order to explore which of the UDL learning design considerations could be relevant for the meaningful gamification design of the OpenVM Learning Hub, meaningful gamification research in the Open Virtual Mobility project has been conducted from January to September 2018 and has comprised the following steps:

- development of research methodology and items (list of gamification features),
- first online survey with 13 project partners using MoSCoW method to prioritise features,
- data analysis and interpretation, creating a shortlist of key gamification features
- second online survey with 10 project partners assessing MUST and SHOULD features,
- data analysis and allocation of gamification features to project outputs,
- preparation of the final report on gamification concept and research.

The first online survey was dedicated to a wide choice of personalisation/customisation options related to different design elements of the OpenVM Learning Hub. The survey involved project partners (n = 13) in the definition of meaningful gamification elements and their prioritisation which was performed using the MoSCoW method to prioritise

ISBN 978-615-5511-25-7

requirements. The MoSCoW method was used to prioritise meaningful gamification features as follows:

- MUST: Requirements labelled as *MUST* are critical for the success of the OpenVM Learning Hub. If a MUST requirement is not included, the meaningful gamification approach will be a failure.
- SHOULD: Requirements labelled as *SHOULD* are important but not a first priority, e. g. not as time-critical as MUST and can be implemented later, after MUST features have been implemented.
- COULD: Requirements labelled as *COULD* are desirable but not necessary, e. g. they can improve learner experience in the Learning Hub for little cost and can be included if time and resources permit.
- WON'T: Requirements labelled as *WON'T* are least-critical or are not feasible for the project, e. g. there is no required expertise or resources in the project. Won't requirements will be dropped.

The Must/Could/Should/Won't assessment of meaningful gamification features helped to cluster a wide range of learning design options, which were analysed in the next step, using the second online survey.

The second online survey was dedicated to a shortlist of key gamification features for the meaningful gamification design of the OpenVM Learning Hub. The second survey was based on the results of the results of the first survey including open comments. The shortlist of gamification features included only MUST and SHOULD requirements from the first survey. The survey involved project partners (n = 10) in definition of user-appropriate and feasible gamification mechanics. The shortlist of key features was assessed against two key criteria: (a) importance, and (b) feasibility and partners were asked to indicate if they can implement important and feasible features in the outputs they lead. Based on the results of the second survey on meaningful gamification features, a user-centred design of meaningful gamification involving potential Virtual Mobility Learning Hub users with focus on teachers and students in higher education is planned to be finalised by the end of 2018.

Meaningful Gamification Design

The meaningful gamification design of the OpenVM Learning Hub is based on extensive review of literature on meaningful gamification and Universal Design for Learning (UDL) as well as own gamification research in the OpenVM project as described in the section above. The meaningful gamification design follows the overall project aim of enhancing readiness for the uptake of virtual mobility in higher education. The meaningful gamification design is applied to key learning and collaboration activities in the OpenVM Learning Hub. These include:

- co-design of Open Educational Resources (OER),
- co-design of collaborative learning activities in the OpenVM MOOC,

ISBN 978-615-5511-25-7

- peer-assessment of evidence as part of e-assessment and open credentialing of virtual mobility skills.

Involving learners in co-designing OER and collaborative learning activities in the OpenVM MOOC is planned to be accomplished by using such approaches as "Crowd Creation" (Solemon et al., 2013) and "Open Learning through Design" (Bartoletti, 2016). The co-design approach engages learners in creating learning activities and learning resources as a way to develop own virtual mobility skills and enhance own readiness to effectively design and participate in virtual mobility. Further design considerations based on the meaningful gamification research (online surveys with project partners as described above) are summarised in Table 1.

Table 1: Results of the meaningful gamification research based on the Universal Design for Learning Guidelines

WHY	GOALS: Learner can see desired outcomes/skills (e. g. open badges) ENGAGEMENT: Learners are engaged by storytelling (e.g. student journey) ENGAGEMENT: Learners have multiple entry points for learning process ENGAGEMENT: Learners receive cues to draw attention to critical concepts ENGAGEMENT: Learners receive prompts to activate prior knowledge
WHAT	CONTENT: Learners can choose content in different languages CONTENT: Learners can create own content PROGRESS: Learners receive awards for reaching sub-goals and final goals PROGRESS: Learners can compare their progress with others (visualisation) ASSESSMENT: Learners can choose types of assessment (e. g. evidence-based, test-based) ASSESSMENT: Learners can choose types of evidence to demonstrate learning outcomes/VM skills
HOW	ACTIVITIES: Learners can create own content ACTIVITIES: Learners are offered challenges (tasks that require effort to solve) FEEDBACK: Learners are offered different types of feedback (human and automated) FEEDBACK: Learners can express and see emotions (e. g. emojis, emoticons) COLLABORATION: Learners can build teams and choose to work together (e. g. co-design OER) COLLABORATION: Learners can use interactive tools like discussion forums, chats

Summary

Meaningful gamification calls not only for the freedom of learners but also for meaningful constraints placed upon learners' choices in order to provide guidance. The gamification design of the OpenVM Learning Hub aims to align choice-making that is meaningful to the learner and the overall goals of the project which is to enhance the development of virtual mobility skills as a way to enhance readiness for its uptake in higher education. Therefore, the OpenVM Learning Hub is designed as a flexible system which allows learners to choose from a variety of options on a micro- and meso-levels and while providing guidance and orientation on the meta-level of design.

ISBN 978-615-5511-25-7

References

1. Bartoletti, R. (2016). Learning through Design: MOOC Development as a Method for Exploring Teaching Methods. *Current Issues in Emerging eLearning, 3*(1). Retrieved from http://scholarworks.umb.edu/ciee/vol3/iss1/2
2. Dauksiene, E., Tereseviciene, M., & Volungeviciene, A. (2010). Virtual Mobility Creates Opportunities. Application of ICT in Education 2010: experience, issues and perspectives of e-studies. *Conference Proceedings, Kaunas, Lithuania*, 30–35. Retrieved from https://www.researchgate.net/publication/317549367_VIRTUAL_MOBILITY_CREATES_OPPORTUNITIES
3. Deci, E., Koestner, R., & Ryan, R. (2001). Extrinsic rewards and intrinsic motivations in education: Reconsidered once again. *Review of Educational Research, 71*(1), 1-27.
4. Deterding, S. (2011). *Meaningful play: Getting «gamification« right.* Paper presented at the Google Tech Talk, January 24, 2011. Retrieved from http://www.slideshare.net/dings/meaningful-play-getting-gamification-right
5. Nicholson, S. (2012). *A user-centered theoretical framework for meaningful gamification.* Paper Presented at Games+Learning+Society 8.0. Retrieved from http://scottnicholson.com/pubs/meaningfulframework.pdf
6. Rose, D., & Meyer, A. (2002). *Teaching Every Student in the Digital Age: Universal Design for Learning.* Alexandria, VA: ASCD.
7. Solemon, B., Ariffin, I., Din, M.M., & Anwar, R.M. (2013). A review of the uses of crowdsourcing in higher education. *International Journal of Asian Social Science, 3*(9), 2066-2073.

ISBN 978-615-5511-25-7

Towards Personalized Guidance and Support for Learning
Proceedings of the 10th European Distance and E-Learning Network Research Workshop, 2018
Barcelona, 24-26 October, 2018
ISBN 978-615-5511-25-7

THE TIME FACTOR IN STUDIES ON DROPOUT IN ONLINE HIGHER EDUCATION: INITIAL REVIEW OF THE LITERATURE AND FUTURE APPROACHES

Marlon Xavier, Julio Meneses, Universitat Oberta de Catalunya (UOC), Spain

Summary

This paper addresses the factor of *time* in relation to dropout in online higher education (OHE), linking both to fully online models such as UOC's. In OHE, time-related reasons are the most important factors for dropping-out; conversely, time management factors emerge as a key issue for continuance intention and re-enrolment. This paper thus presents an initial review of the literature, with key concepts and approaches on the time factor, which shall inform future research. Key issues are centred upon two phenomena: the *flexibility* offered by OHE and asynchronous learning, which is the main attraction for busy adult learners but can also induce *procrastination* and conflict; and the common *misconceptions* about the magnitude of workload, time, and effort required by OHE. We present two main theoretical approaches: time management studies, and work-study-home conflict/balance; and discuss possible implications and interventions for fully online models of OHE.

Dropout in online higher education and the time factor

Over the last 20 years, research on dropout in online higher education (OHE) have gained tremendous importance. Most studies investigate the factors that influence attrition, retention, persistence, and success, trying to construct new models of attrition and profiles of students most likely to dropout or persist. A review of the research (Holder, 2007) on the profile of persisters indicates that, besides being academically prepared, they possess time management skills and high levels of engagement, self-directedness, self-discipline, motivation, and commitment.

In that regard, the time factor has been pointed out as an important issue for dropout in many studies in traditional, brick-and-mortar universities. Kember (1999), the author of a classic model on attrition, mentioned that many students face difficulties in trying to conciliate study requirements with conflicting demands from family, work, and social commitments. Reviewing the literature in Spanish on dropout in higher education, Tuero, Cervero, Esteban, and Bernardo (2018) found that one of the most important variables is the time dedicated to work while studying. However, other studies (e.g. Sánchez-Gelabert & Andreu, 2017) found that what really makes it difficult for the students to persist are not the hours dedicated to a job, but their time management skills – which allow them to balance effectively their study and job responsibilities. Other factors connected to dropout proneness and persistence also

have strong correlations with the time factor. Success and performance in traditional educational settings are strongly influenced by time management skills (Michinov, Brunot, Le Bohec, Juhel, & Delaval, 2011). That influence is stronger in non-traditional students – adult learners, which constitute the majority in OHE – who are usually more affected by work-study and family-study obligations (O'Toole & Essex, 2012).

In the context of online open universities, on the other hand, the influence on dropout of factors related to time are even stronger. In a review of dropout factors in OHE, Lee and Choi (2011) found a number of studies that highlighted time management skills, estimation of the time required to balance academic and professional obligations, and ability to juggle roles/balancing multiple responsibilities as key factors that influence persistence and attrition.

The Universitat Oberta de Catalunya (UOC) radicalizes such context. As a *fully* distance teaching university, it delivers education through an asynchronous mode based on e-learning (Sangrà, 2002), with a highly flexible educational model with no permanence requirements and very few enrolment requirements. UOC's typical students mirror the main group likely to enrol in virtual university degrees, that of *non-traditional learners*: mature-aged or adult, with full-time or part-time jobs and family responsibilities, or a combination of these characteristics. Statistically, 40.5% of students are 30 or over, 81.5% study and work, and 72.6% have a prior university education; dropout rate at UOC is 57.6%, with first semester drop-outs accounting for nearly half of this total (Grau-Valldosera, Minguillón, & Blasco-Moreno, 2018). The correlation is clear: "non-traditional students tend to drop out more frequently than their traditional counterparts even when they have good performance" (Sánchez-Gelabert & Andreu, 2017; p.28). UOC's flexible model implies that online learning is largely self-directed and dependent upon the learners' agency and ability to manage their personal and academic responsibilities. However, this produces high attrition rates, especially after finalizing their first semester, due to misconceptions learners have about the workload (Bawa, 2016), and their home/family obligations and employment commitment (Carroll, 2008). Grau-Valdossera et al. (2018) thus point that time-related reasons were the most important factors for dropping-out; conversely, time management factors during the first semester emerge as a key issue for continuance intention and re-enrolment.

Therefore, if *time* appears to be a crucial factor for attrition both in face-to-face and online learning environments, more research is needed on its impact and dynamics in fully OHE models such as UOC's, so as to improve retention, performance, evaluation, and personalized guidance and support for e-learning.

The time factor: initial review and implications for OHE

This paper thus presents an initial review of the literature, with key concepts and approaches on the time factor, which shall inform future research. The key issues seem to be centred upon two phenomena: the *flexibility* offered by OHE and asynchronous learning, which is the main attraction for busy adult learners but can also induce or facilitate *procrastination* and conflict (Doherty, 2006; Holder, 2007); and the common *misconceptions* about the magnitude of

ISBN 978-615-5511-25-7

workload, time, involvement, and effort required by OHE (Bawa, 2016). Indeed, time related issues involved in online courses have replaced the problem of distance (Mason, 2001) that was more typical of brick-and-mortar universities and are clearly connected to high attrition rates in online learning environments.

In that regard, many authors (see Holder, 2007, for a review) stressed the importance of *time management* for persistence and successful online learning. Bunn (2004) found that students with a heavy workload tended to persist and succeed, provided they had good time management skills so as to deal effectively with conflictive demands. Reviewing the literature, Lee and Choi (2011) found that the skills included the ability to estimate the time and effort required for a task, to manage time effectively, and to balance multiple responsibilities. Conflictive demands raised by engaging with OHE degrees seem to be central for persistence and attrition. Reviewing the most common reasons for withdrawal, Ashby (2004) found that the most important ones were "the difficulties students have in juggling their studies with other aspects of their lives", especially personal/family or employment responsibilities, concluding that "[t]ime is clearly a major issue for O[pen] U[niversity] students" (p.72). Corroborating other literature, Yukselturk and Inan (2006) found that the most important factor affecting student retention is finding sufficient time to study; work life demands played a special role in that. Such phenomena have been studied via two main theoretical approaches: *time management* and *work-study-home balance/conflict*.

Theoretical approaches

Time management approach

Time management can be defined as the ability to plan study time and tasks (Broadbent & Poon, 2015), or the learners' scheduling, planning, and properly managing their study time (Pintrich, 2004). It has been studied as part of academic self-regulated learning (SRL) strategies (Pintrich, 2004). Self-regulation is more crucial in online education (i.e., given the lack of face-to-face interaction with instructors and peers, no need to be physically present), for it heavily relies on active, autonomous participation. Among the SRL strategies with the strongest findings for academic achievement is time management (Broadbent & Poon, 2015). An analogous, slightly more specific concept is employed by Puspitasari (2012): *study time management*, which refers to "academic time management, in which one is managing his or her time to study by setting learning goals, scheduling study time, and monitoring the attainment of the learning goals" (p.6).

A secondary and related theoretical approach refers to studies on academic *procrastination*, which is viewed as a specific learner characteristic in time management and is defined as intentionally postponing or delaying work that must be completed (Michinov et al., 2011). Research into the relationship between procrastination, motivation, and performance has forayed into their underlying self- and social-regulation processes, showing that higher levels of procrastination are related to lower levels of self-regulation and poorer learning outcomes (Michinov et al., 2011).

ISBN 978-615-5511-25-7

Research has found numerous correlations between time management skills/procrastination and motivation, retention/persistence, performance, and dropout proneness. Holder (2007) points that time management skills are connected to learning orientation (cognitive styles), environment (allocating space and time to study), and motivation (to avoid procrastination in self-directed learning). Not surprisingly, in asynchronous learning, time management is strongly connected to performance (Loomis, 2000). Conversely, procrastination is negatively related to leaners' participation and performance (Michinov et al., 2011). Regarding online academic achievement/success, a review of the literature by Michinov et al. (2011) found a significant positive relation with time management/study management. Of course, all these factors impact dropout and persistence in OHE. Time restraints, lack of time, time management, and procrastination are the primary reasons for students failing or dropping an online course (Doherty, 2006). In contrast, time management is a key factor for persistence: persisters score higher in emotional support, self-efficacy, and time and study management (Holder, 2007).

Work-study-home conflict/balance approach

This approach is derived from the tradition of research on work-family balance/conflict. Work/study, or work/school conflict (WSC), is defined as the degree to which work affects the student's ability to meet school-related demands and responsibilities (McNall & Michel, 2017). Eller, Araujo, and Araujo (2016) extended the concept to research *work-study-home* conflict/balance in online master's students. However, the emphasis on conflict dominates research, which usually seeks to study its impact on stress and well-being, and indicates that non-traditional students experience intense conflicts between the work, study, and home domains, especially female students (Carney-Crompton & Tan, 2002). Thus, WSC is negatively related to academic performance (Owen, Kavanagh, & Dollard, 2017). Research usually focuses on the institutional domain – i.e. how its structure and dynamics produce conflictive demands and how to alleviate or prevent them. However, Eller et al. (2016) studied the individual strategies online learners used to manage demands. Yet, being rather new, this approach has produced little research, and there is a lack of research on non-traditional students. It has rarely been applied to study the relation with dropout and persistence in OHE (e.g. Pierrakeas, Xeno, Panagiotakopoulos, & Vergidis, 2004).

Future directions: possible interventions and results

Besides furthering research on the time factor in its relations with dropout and related concepts, some possible interventions and strategies can be envisioned to prevent dropout and time-related conflicts, and to develop and hone learners' time management skills – which would probably improve student retention (and agency, self-direction, performance, success, satisfaction, and motivation). Their focus should be on the first academic year, especially the first semester (which presents the highest attrition rates), and preferably be embedded in ampler interventions, for time management and issues influence and are influenced by other dropout factors - indeed, it is usually the interaction among different factors that lead to

ISBN 978-615-5511-25-7

completion or non-completion (Lee & Choi, 2011). Such strategies would ideally address situational, institutional, and personal factors:

- Provide *flexibility in student assessment* (to avoid dropout or stop-out) (Carroll, 2008);
- *Identify at-risk students* early on and provide them with appropriate, personalized training opportunities and support (Pierrakeas et al., 2004), e.g. an introductory course for the organization of academic work;
- Provide *targeted advice and orientation* to students, regarding time management, procrastination issues, and a realistic picture of what is required at various stages of the course, especially at key points (first semester/first year) and to students identified as "at risk" (Ashby, 2004; p.74);
- Design *personalized course plans* and curricula, focusing on adequate first enrolment;
- Provide *staff trainings* to qualify staff and provide guidance/support regarding such issues (Castles, 2004).

Finally, more research on the subject is needed in order to build robust frameworks for action, implementation, and monitoring the impact of interventions (Ashby, 2004), especially in the context of fully online universities. UOC has recently implemented a research/interventional institutional project, called ESPRIA ("First-year students"), which shall further enrich our scientific understanding of these important matters and how to deal effectively with them.

References

1. Ashby, A. (2007). Monitoring student retention in the Open University: definition, measurement, interpretation and action. *Open Learning, 19*(1), 65-77. doi:10.1080/0268051042000177854
2. Bawa, P. (2016). Retention in online courses: Exploring issues and solutions – A literature review. *Sage Open, 6*(1), 1-11. doi:10.1177/2158244015621777
3. Broadbent, J., & Poon, W. L. (2015). Self-regulated learning strategies & academic achievement in online higher education learning environments: A systematic review. *The Internet and Higher Education, 27*, 1-13. doi:10.1016/j.iheduc.2015.04.007
4. Bunn, J. (2004). Student persistence in a LIS distance education program. *Australian Academic & Research Libraries, 35*(3), 253–69. doi:10.1080/00048623.2004.10755275
5. Carney-Crompton, S., & Tan, J. (2002). Support systems, psychological functioning, and academic performance of nontraditional female students. *Adult Education Quarterly, 52*(2), 140-154. doi:10.1177/074171360205200205
6. Carroll, D. (2008). *Factors affecting the retention and progression of postgraduate Business distance education students.* (Master's dissertation). University of Southern Queensland, Brisbane, Australia. Retrieved from https://eprints.usq.edu.au/4922/

ISBN 978-615-5511-25-7

7. Castles, J. (2004). Persistence and the adult learner: Factors affecting persistence in Open University students. *Active Learning in Higher Education, 5*(2), 166–179. doi:10.1177/1469787404043813

8. Doherty, W. (2006). An analysis of multiple factors affecting retention in web-based community college courses. *The Internet and Higher Education, 9*, 245–255. doi:10.1016/j.iheduc.2006.08.004

9. Eller, A. M., Araujo, B. B., & Araujo, D. B. (2016). Balancing work, study and home: A research with master's students in a Brazilian university. *RAM. Revista de Administração Mackenzie, 17*(3), 60-83.

10. Grau-Valldosera, J., Minguillón, J., & Blasco-Moreno, A. (2018). Returning after taking a break in online distance higher education: From intention to effective re-enrolment. *Interactive Learning Environments, 15*(1). doi:10.1080/10494820.2018.1470986

11. Holder, B. (2007). An investigation of hope, academics, environment, and motivation as predictors of persistence in higher education online programs. *Internet and H Education, 10*(4), 245–260. doi:10.1016/j.iheduc.2007.08.002

12. Kember, D. (1999). Integrating part-time study with family, work and social obligations. *Studies in Higher Education, 24*(1), 109-124. doi:10.1080/03075079912331380178

13. Lee, Y., & Choi, J. (2011). A review of online course dropout research: implications for practice and future research. *Educational Technology Research and Development, 59*(5), 593–618. doi:10.1007/s11423-010-9177-y

14. Loomis, K. D. (2000). Learning styles and asynchronous learning: Comparing the LASSI model to class performance. *Journal of Asynchronous Learning Networks, 4*(1), 23–32.

15. Mason, R. (2001, Feb). *Time is the new distance?* Inaugural Lecture, Open University, Milton Keynes, UK.

16. McNall, L. A., & Michel, J. S. (2017). The relationship between student core self-evaluations, support for school, and the work–school interface. *Community Work & Family, 20*(3), 1-20. doi:10.1080/13668803.2016.1249827

17. Michinov, N., Brunot, S., Le Bohec, O., Juhel, J., & Delaval, M. (2011). Procrastination, participation, and performance in online learning environments. *Computers & Education, 56*(1), 243–252. doi:10.1016/j.compedu.2010.07.025

18. O'Toole, S., & Essex, B. (2012). The adult learner may really be a neglected species. *Australian Journal of Adult Learning, 52*(1), 183-191. Retrieved from https://www.learntechlib.org/p/54800/

19. Owen, M. K., Kavanagh, P. S., & Dollard, M. S. (2017). An Integrated Model of Work–Study Conflict and Work–Study Facilitation. *Journal of Career Development*, 1-14. doi:10.1177/0894845317720071

ISBN 978-615-5511-25-7

20. Pierrakeas, C., Xeno, M., Panagiotakopoulos, C., & Vergidis, D. (2004). A comparative study of dropout rates and causes for two different distance education courses. *International Review of Research in Open and Distance Learning, 5*(2). doi:10.19173/irrodl.v5i2.183

21. Pintrich, P. R. (2004). A conceptual framework for assessing motivation and self-regulated learning in college students. *Educational Psychology Review, 16*(4), 385-407. doi:10.1007/s10648-004-0006-x

22. Puspitasari, K. (2012). *The effects of learning strategy intervention and study time management intervention on students' self-regulated learning, achievement, and course completion in a distance education learning environment.* (Doctoral dissertation). Florida State University, Tallahassee, FL, USA. Retrieved from https://diginole.lib.fsu.edu/islandora/object/fsu:183075/datastream/PDF/view

23. Sánchez-Gelabert, A., & Andreu, M. E. (2017). Los estudiantes universitarios no tradicionales y el abandono de los estudios. *Estudios sobre Educación, 32*, 27-48. doi:10.15581/004.32.27-48

24. Sangrà, A. (2002). A new learning model for the information and knowledge society: The case of the Universitat Oberta de Catalunya (UOC), Spain. *The International Review of Research in Open and Distributed Learning, 2*(2), 1-19. Retrieved from http://www.irrodl.org/index.php/irrodl/article/view/55/114

25. Tuero, E., Cervero, A., Esteban, M., & Bernardo, A. (2018). ¿Por qué abandonan los alumnos universitarios? Variables de influencia en el planteamiento y consolidación del abandono. *Educación XX1, 21*(2), 131-154. doi:10.5944/educxx1.20066

26. Yukselturk, E., & Inan, F. A. (2006). Examining the factors affecting student dropout in an online learning environment. *Turk. online j. distance educ., 7*(3), 76-88. Retrieved from https://files.eric.ed.gov/fulltext/ED494345.pdf

ISBN 978-615-5511-25-7

Towards Personalized Guidance and Support for Learning
Proceedings of the 10th European Distance and E-Learning Network Research Workshop, 2018
Barcelona, 24-26 October, 2018
ISBN 978-615-5511-25-7

SUPPORTING AUTONOMOUS LEARNING: THE ROLE OF PROJECT DESIGN AND STUDENTS' COORDINATION IN INTERCULTURAL EXCHANGE PRACTICE

Marta Fondo, Universitat Oberta de Catalunya, Spain, Michael Arnold, University of Minnesota, United States of America

Abstract

Telecollaboration and/or e-tandem projects have been developed and implemented since the appearance of web-based internet communication tools. Their embryonic versions through emails evolved into synchronous instant writing, chatting and video chat. Communication, therefore, moved from the fixed environments offered by desktop computers to seamless communication experiences everywhere in a portable multi-device option bringing about a new learning scenario for developing intercultural competences and Foreign Language (FL) practice. Surprisingly, virtual exchanges between students from different countries are not yet widely used and spread in Higher Education (HE). This study reflects on the challenges and possible solutions in order to optimise the learning experience in telecollaboration projects. Project design, students' support and coordination, and students' perception of the intercultural exchange project between learners in the US, Mexico, Ireland and Spain are analysed through a mixed-methods approach and presented with the aim of raising awareness of the benefits and easiness of implementing successful telecollaborative projects in HE. In addition, this article aims to offer recommendations to institutions interested in implementing telecollaboration projects in order to provide their students with a profitable and engaging telecollaborative experience.

Introduction

According to the European Commission (2018; p.3) "People need the right set of skills and competences to sustain current standards of living, support high rates of employment and foster social cohesion in the light of tomorrow's society and world of work", a statement also found in the UNESCO's Declaration of Incheon (2015). As a result, HE objectives have been also aligned with lifelong learning principles, pointing at the importance of developing different transversal skills for academic success and employability. Among others, telecollaboration practices foster the development of intercultural, social, foreign language, problem-solving, negotiating, digital and communicating skills. Taking advantage of the web 2.0 communication tools learners have the opportunity to develop such skills thanks to the interaction with a person from a different cultural and language reality. Unfortunately, Information and Communication Technologies (ICTs) are still misused and underutilised in many FL learning environments. However, is this the real challenge of telecollaboration

practices? What are the elements involved in online intercultural exchanges that could help provide a profitable learning experience to learners and teachers?

Telecollaboration in Higher Education

According to Dooly (2017; p.170), "Telecollaboration in education is the use of computer and/or digital communication tools to promote learning through social interaction and collaboration", thus moving the learning process beyond the physical boundaries of classrooms. As O'Dowd (2016) summarises there are two different purposes for telecollaborative exchange: "'authentic' interaction with native speakers or with learners from other countries" and "first-hand experience of 'real' intercultural communication" (p.275). Online intercultural exchanges develop intercultural competence, FL skills and e-literacies and offer an internationalisation of the classroom, that is to say, authentic intercultural experiences for students who do not have the opportunity of travelling.

Methodology

The study

The study uses a mixed-methods approach aiming to explore more in detail the role played by the pedagogy behind the course design and the coordinator presence effect on the low rates of the aforementioned intercultural exchange. The very positive feedback received from the students about the project is also analysed as it, empirically, could be considered as a sign of success and quality of the intercultural exchange project. In this regard, quantitative data has been used in order to measure and present the results of the project while qualitative data provides the deeper understanding of the results. Professional experiences with e-tandem projects of professors at the University of Minnesota interviewed by Michael Arnold and his self-reported experience brings the teacher perspective to the study, complementing the students' perceptions.

The project

The project was a two-month online intercultural exchange between five different universities: Universitat Oberta de Catalunya (UOC), University of Minnesota (UMN), University of Maryland (UMB), University of Limerick (UL) and Benemérita Universidad Autónoma de Puebla (BUAP). The project was designed, implemented and coordinated by Marta Fondo from Universitat Oberta de Catalunya. After a first piloting counting on researchers from Universitat Oberta de Catalunya the project was launched on the 6th of March of 2018 as a compulsory activity.

The sample

The sample of this study was a total of 114 students from the five universities mentioned above. Only two students from the BUAP joined the one-on-one exchange. The other 25 students from Mexico took part in a monolingual virtual exchange with Queens College New

ISBN 978-615-5511-25-7

York in English. Therefore, students from New York have been excluded for this study as they only developed intercultural skills and did not aim to practice a FL.

In the one-on-one project, eighty students were paired in forty pairs. In the monolingual project the 25 Mexican students were paired in a one-to-many basis with 150 students in New York (25 groups of 6 students each). The students enrolled on a voluntary basis although the project did count toward ten per cent of their final grade. All the participants were paired according to their time availability shared in the Doodle document. The students received a participant code in order to anonymise their participation in the project from the very beginning. Due to the research work done in the background, participants had to fill in questionnaires at the beginning of the project, in each speaking practice session and at the end of the project. Students were also asked to record their sessions for post-hoc observation.

The scenario

The one-on-one telecollaboration project was structured by tasks which were designed to fit into the business subjects' curricula. Five different communicative task types (spot the difference, free-talk, decision-making, role-play and opinion exchange) were used in order to better analyse the preferences and adequacy of each one according to the students' opinion expressed in the task evaluation questionnaires. In every session, students had two different tasks of the same type and questions for intercultural reflection about the topic of the task in Spanish and in English to ensure that both learners had the same opportunity to practice the FL. The monolingual one-to-many project was structured in 5 sessions with topics and questions for intercultural reflection.

Results

Participation

From the original 40 pairs in the one-on-one modality, 31 finished the project. The students who suffered a non-active or dropped-out partner (n = 12) were included in alternative online exchanges with the coordinator of the project to allow them to complete the five required tasks and benefit from the project despite the fact that they had lost their partner. A total of 91 students, from the initial 114, were active during the project. Seventy-one students completed the 5 tasks, 18 students 3 or more tasks and only two of them did less than 2 tasks (see Table 1).

Table 1: Students profile and participation rates

Institution	Sample	Participation			Completed tasks		
University	Students Enrolled	Active	Non-active	Drop-out	5	>3	<2
BUAP	27	23	2	2	13	8	2
UL	19	16	2	1	13	3	0
UMN	22	20	2	0	18	2	0
UMBC	6	2	3	1	2	0	0
UOC	40	30	0	10	25	5	0
Total	114 (100%)	91 (81%)	9 (7%)	14 (12%)	71 (78%)	18 (20%)	2 (2%)

ISBN 978-615-5511-25-7

End-of-project questionnaire

A 1-5 Likert scale *end-of-project questionnaire* was sent by email to the participants after closing the project. 77 students filled it in. 29 English speakers (17 female and 12 male from 18 to 23 yoa) and 48 Spanish speakers (28 female and 20 male from 18 to 50 yoa).

Looking at the results of the *end-of-project questionnaire* (Table 2), students who answered the question "How important are the following elements in an online language exchange like this one?" seem to consider coordination as important as having an assiduous and committed partner. Students also value having the support of communicative tasks during the online sessions, although tasks seem to be less important for the students. Indeed, 75% of the English speakers (ES) and 64% of the Spanish speakers (SS) considered tasks as important and very important. In contrast, coordination was valued as important and very important by 90% of the ES and 87% of the SS and having a committed partner by 97% of the ES and 91% of the SS.

Table 2: Results from the end-of-project questionnaire

Item	Answer	Eng.	Spa.
Coordination of participants	Important/ Very important	90.5%	83.5%
Coordination of activities	Important/ Very important	90.7%	87.7%
Mediating in problems with partner	Important/ Very important	71.9%	65.3%
Responding to doubts about the procedures	Important/ Very important	74.9%	77.6%
To get help scheduling the sessions with your partner	Important/ Very important	59.4%	55.1%
To have a committed partner during the session	Important/ Very important	97.1%	91%
To have good tasks to carry out during the sessions	Important/ Very important	75%	69.4%
Enjoying carrying out different task types	Important/ Very important	69.4%	63.3%

However, after analysing the open question at the end of the questionnaire (see Table 3) the most valued element by the students in order to have a successful exchange is clearly the partner, followed by the tasks, and the project structure; leaving coordination and support in the last position, or the least mentioned element in the students' answers. This difference could be due to the fact that learners had focused more on their experiences during the sessions than on the broader perspective of the whole project. The answers gathered were in

ISBN 978-615-5511-25-7

response to a reflective open question in the end-of-project questionnaire "In your opinion, what are the most important elements to have a successful online intercultural exchange experience? Please, enumerate them and explain why they are important".

Table 3: Students opinions shared in the end-of-project questionnaire

Open question: "In your opinion, what are the most important elements to have a successful online intercultural exchange experience? Please, enumerate them and explain why are they important"	
Partner	"to have a partner who is engaging and enthusiastic" "Having a person that's understanding and willing to help others improve!"
Structure and tasks	"there needs to be a strong program in place that provides a structure and activities to conduct each session." "I think that the tasks are a huge part of whether or not someone would enjoy an exchange like this."
Coordination	"Coordinators following-up constantly because it helped me to solve doubts and problems. It also helped me a lot to put me in contact with my partner" "having help from professors"

The challenges perceived by the students in telecollaboration practices extracted from the *end-of-project questionnaire* can be divided into two categories related to student and structure and are related to emotional factors, management and, overall, lack of quality in the projects as summarised in Table 4.

Table 4: Summary of barriers in telecollaboration extracted from the *end-of-project questionnaire*

Main barriers threatening success in telecollaboration	
Student	Environment
Fear of using technological devices	Lack of clear instructions
Fear of interacting with someone they do not know	No user-friendly communication tools
Anxiety	No clear structure
Fear of being culturally inappropriate	No aim in the exchanges
Communication apprehension	No communicative tasks for the sessions
No compatible times to meet	Not integrated into the subject
Big age difference	No troubleshooting service
	No follow-up of student's activity
	No personal support

The case of the University of Minnesota. Interviewed professors and self-reported contribution

During his first experience testing out the Tandem exchanges while teaching for the Department of Spanish and Portuguese Studies at the University of Minnesota, Dr Michael Arnold had attempted a variety of strategies at different levels of L2 language learning: from mandatory, open-ended conversation exchanges graded on completion to optional and highly

ISBN 978-615-5511-25-7

structured exchanges recorded and graded. In his overall experience, a higher level of linguistic and topical scaffolding provided to the students prior to the first exchanges were a far greater long-term determinate for student compliance than were all other factors combined (mandatory vs. optional, completion credit vs. rubric graded, L2 level, etc.).

Many of the instructors who participated in some form of internet-based language exchange at the University of Minnesota had similar experiences to that of Dr Arnold. The following represents a sample of responses given to this question: "In your experience have you found students to appreciate more or less structured conversations in these exchanges?"

> *"While there is no single recipe for success, my experience working with intermediate English/Spanish language learners in paired Tandem exchanges has taught me to err on the side of providing more structure...[This helps to] minimize the considerable anxiety experienced by many upon speaking with a new person" (Arthur Strawbridge, University of Minnesota Department of Spanish and Portuguese Studies Graduate Instructor)*

> *"When I think about what students complain about or the suggestions they make for improvement, I don't remember students ever suggesting the exchanges be LESS structured. In contrast, suggestions for improvement tend to suggest more structure, common goals, instructor guidelines, prescribed technology, etc." (Dr Elizabeth Kautz, Director of TandemPlus Class-to-Class Exchanges and German 1003 Coordinator at the University of Minnesota Department of German, Scandinavian and Dutch)*

Discussion

Telecollaboration is a good example that technology in itself is not an educational tool. Since online exchanges appeared they have evolved from asynchronous to synchronous, from written to oral and eventually to multimodal communication through videoconferencing tools with written (text chat), oral (voice) and image (video). However, the means do not lead to the ends by themselves. Technology provides the opportunity but agency is needed and for this to happen a pedagogical purpose, structure and activities (tasks) must support and guide the exchange taking into account the main barriers expressed by the students (Table 4). According to van Lier (2000; p.253), "in language teaching, we must provide students with a rich semiotic budget, that is, to structure the learner's activities and participation so that access is available and engagement encouraged".

According to the students' answers and the experiences of the professors in the University of Minnesota, the tasks are perceived as an important element for having successful online exchanges (Table 2 and 3) as they provide the reason to interact and make the interaction more meaningful. This perception is directly aligned with the theoretical principle of Task-Based Language Teaching (TBLT) as Gonzalez-Lloret and Ortega (2014; p.4) summarise "Language learning tasks which are mediated by new technologies can help minimize

ISBN 978-615-5511-25-7

students' fear of failure, embarrassment, or losing face; they can raise students' motivation to take risks and be creative while using language to make meaning".

The results seem to reflect the "three levels" of Devlieger and Goossens (2007). As summarised by Müller-Hartman (2016) there are three circles (levels) each lying inside the other that facilitate a rich task-based interaction, and thus create a "powerful learning environment for language learning". The first circle or level is a safe environment in which the learner can express herself and take risks, in this case, a reliable videoconferencing tool and a friendly partner. The second level is the design and application of tasks that are motivating, meaningful, relevant, and also challenging. And the third circle or level is the teacher who is responsible for creating a safe environment, designing the tasks and offering support, in this case, this role has been taken by the coordinator. In summary, as Tella and Harjanne (2007) defend "the foreign language and the language tasks offered to the pupils in a foreign language classroom—physical or virtual—become affordances only when they perceive them and act accordingly by exploiting them as practice, participation, communication and learning opportunities".

Conclusion

The students' voice talks about the need of providing structure, tasks and support in online intercultural projects. In this regard, it is important to balance students' autonomy and support, as self-management and independent critical thinking are developing skills which cannot be taken for granted. Scaffolding autonomous learning experiences as telecollaboration practices will assure a more profitable and enjoyable experience helping students to be more engaged and motivated. The structure of the project and content of the tasks should be integrated in and aligned with the curricula of the subjects in which the projects are integrated and the task design should aim to foster fun and meaningful conversations between the learners. Autonomy cannot mean isolation, especially in online environments in which dropping out or giving up is as easy as not replying to your partner or teacher's emails. Emotional support and engagement is, therefore, also an element to include in telecollaboration projects in order to reduce drop-out rates. Taking into account the importance given to the role of the coordinator as an orchestrator and troubleshooting person, it is worthy to highlight the need of teacher training for telecollaboration competencies (Melchor-Couto & Jauregui, 2016) as in many cases, the role of coordinator is played by the teachers themselves. Institutions should bear in mind that the main problems teachers face in these types of teaching practices are the lack of institutional support in a very time-consuming projects (Guth, Helm, & O'Dowd, 2012). The results of the present study aim to help teachers, instructional designers and institutions to provide their students with more enjoyable and profitable online intercultural exchanges. However, further research is needed in order to transfer these results into different scenarios as well as to increase their validity and reliability. The project will be replicated in the next spring 2019 with the objective of gathering new data to support the findings in this study.

ISBN 978-615-5511-25-7

References

1. Devlieger, M., & Goossens, G. (2007). An assessment tool for the evaluation of teacher practice in powerful task-based language learning environments. In K. van den Branden, K. van Gorp, & M. Verhelst (Eds.), *Tasks in action. Task-based language education from a classroom-based perspective* (pp. 92-130). Cambridge: Cambridge Scholars Publishing.
2. Dooly, M. (2017). Telecollaboration. In C. A. Chapelle & S. Sauro (Eds.), *The handbook of technology and second language teaching and learning* (pp. 169-183). Hoboken, New Jersey: John Wiley & Sons.
3. European Commission (2018). *Council Recommendation on Key Competences for Lifelong Learning.* Retrieved from http://data.consilium.europa.eu/doc/document/ST-9009-2018-INIT/EN/pdf
4. Gonzalez-Lloret, M., & Ortega, L. (2014). *Technology-mediated TBLT: researching technology and tasks.* Amsterdam/Philadelphia: John Benjamins. https://doi.org/10.1075/tblt.6
5. Guth, S., Helm, F., & O'Dowd, R. (2014). Telecollaborative Foreign Language Networks in European Universities: A Report on Current Attitudes and Practices. *Bellaterra Journal of Teaching & Learning Language & Literature, 7*(4), 1–14.
6. van Lier, L. (2000). From input to affordance: Social-interactive learning from an ecological perspective. In Lantolf, J. P. (Ed.), *Sociocultural Theory and Second Language Learning* (pp. 245–259). Oxford: OUP.
7. Melchor-Couto, S., & Jauregi, K. (2016). Teacher competences for telecollaboration: the role of coaching. In S. Jager, M. Kurek, & B. O'Rourke (Eds.), *New directions in telecollaborative research and practice: selected papers from the second conference on telecollaboration in higher education* (pp. 185-192). Research-publishing.net.
8. Müller-Hartmann, A. (2016). A task is a task is a task is a task… or is it? Researching telecollaborative teacher competence development – the need for more qualitative research. In S. Jager, M. Kurek, & B. O'Rourke (Eds.), *New directions in telecollaborative research and practice: selected papers from the second conference on telecollaboration in higher education* (pp. 31-43). Research-publishing.net. https://doi.org/10.14705/rpnet.2016. telecollab2016.488
9. Tella, S., & Harjanne, P. (2007). Can We Afford Any More Affordances? Foreign Language Education Specific Reflections. In Teoksessa K. Merenluoto, A. Virta & P. Carpelan (Eds.), *Opettajankoulutuksen muuttuvat rakenteet* (pp. 500– 5061). Ainedidaktinen symposium 9.2.2007. Turun opettajankoulutuslaitos. Turun yliopiston kasvatustieteiden tiedekunnan julkaisuja B 77.
10. UNESCO (2015). *Incheon Declaration and Framework for Action for the implementation of Sustainable Development Goal 4.* Retrieved from http://unesdoc.unesco.org/images/0024/002456/245656E.pdf

ISBN 978-615-5511-25-7

Towards Personalized Guidance and Support for Learning
Proceedings of the 10th European Distance and E-Learning Network Research Workshop, 2018
Barcelona, 24-26 October, 2018
ISBN 978-615-5511-25-7

MUSEUM EDUCATION COMMUNICATION IN FACEBOOK AND TWITTER

Antonella Poce, Francesco Agrusti, Sebastiana Sabrina Trasolini, Roma TRE University, Italy

Summary

The present contribution is devoted to the presentation of a preliminary qualitative and semi-quantitative study about social media communication in museum education departments, active both in Italian and English language. According to field literature, social media have different kinds of effects in museums development. They are related to communication, the learning process, the growth of creative industries, as well as to their integration in museums contexts (Vassiliadis & Belenioti, 2015).

This study aims to analyse statistics from several Facebook and Twitter accounts based at different Museum Education Departments and Association for Museum Educators. Even if this is a preliminary study that needs further development (for example increasing the number of accounts considered), we consider relevant report some considerations herewith introduced.

Introduction

With the advent of social networks and especially Facebook and Twitter, communication in recent decades has undergone such an evolution that it gave rise to a linguistic change, both from a grammatical and lexical point of view. At the same time, however, the application of social media is becoming a status quo of communication, especially in museums that are the most representative example of cultural production. As stated by Venkatesh and Meamber (2006), museums constitute the creation, dissemination and consumption of cultural products.

Social media also offer visitors new ways to interact through the representation of museums in social media posts and videos, and digital museum collections (Marty, 2008; Jafari et al., 2013; Lepouras & Vassilakis, 2004; Arends et al., 2009; Weilenmann et al., 2013; Poce & Re, 2017). Nevertheless, the new social media approach causes new challenges for museum educators. Firstly, museums fail to create a bidirectional communication through social media between the museum and the visitor/teacher. In literature, Quinton and Fennemore (2013) observe that, although several major museums have integrated Web 2.0 tools, they have adopted a one-way communication mode, totally different from e-marketing. Secondly, museums find difficult to attract and maintain visitor loyalty, and consequently, an effective communication policy is one of the biggest challenges for museums educators.

We then decided to focus on the two major social media nowadays (Facebook and Twitter) and we collected some data about museum education department accounts.

Methodology

In order to identify museum social media accounts to be analysed, we used Google search engine. We used the following queries (in Italian and in English languages):

3. site:www.facebook.com "servizi educativi" museo
4. site:www.facebook.com "education department" museum
5. site:twitter.com "education department" museum
6. site:twitter.com "servizi educativi" museo

For what concerns Facebook, through these queries, we found 4 education department pages for Italian museums (in Italian language), 9 pages of education departments or education services associations for international museums (in English language) for a total of 13 Facebook pages. We want to stress that we did not include museums Facebook pages, but we were focused only on museums educational services pages.

For what concerns Twitter, we found 3 English speaking accounts and 2 accounts related to Italian museums (so in Italian language). In this case also we were looking exclusively for museum education department Twitter accounts and not for general museums accounts.

In this first analysis we realize that, even if nowadays it is mandatory for a museum to have one or more social accounts, it is not common to have a dedicated account for museum education department.

Hereafter are reported Facebook pages and Twitter accounts founded.

Table 1: Facebook Pages and Twitter Accounts considered

Social media	Title	URL	Creation date
Facebook	Sed - Centro per i servizi educativi del museo e del territorio	https://www.facebook.com/ServiziEducativi/	26-01-2012
Facebook	EDUC.a	https://www.facebook.com/educamuseocinema/	26-16-2013
Facebook	MUVE Education	https://www.facebook.com/MUVEeducation/	01-08-2016
Facebook	Sistema Museale Civico Foggia - servizi educativi	https://www.facebook.com/pages/category/Modern-Art-Museum/Sistema-Museale-Civico-Foggia-servizi-educativi-629374743806360/	16-04-2014
Facebook	Fitzwilliam Museum Education Department	https://www.facebook.com/fitzeducation	24-05-2012
Facebook	Museum Education Roundtable	https://www.facebook.com/MuseumEducationRoundtable	22-03-2010
Facebook	Museum Educators of Southern California	https://www.facebook.com/officialMESC	22-02-2010
Facebook	Greater Boston Museum Educators Roundtable	https://www.facebook.com/GreaterBostonMuseumEducatorsRoundtable/	31-08-2010
Facebook	Georgia Museum Educators	https://www.facebook.com/Georgia-Museum-Educators-181483651892391	23-01-2011
Facebook	Connecticut Museum Educator Roundtable	https://www.facebook.com/CTMuseumEd	05-12-2012
Facebook	Museum Educators of Puget Sound	https://www.facebook.com/psmuseums	13-10-2010

ISBN 978-615-5511-25-7

Facebook	National Art Education Association	https://www.facebook.com/arteducators	13-03-2009
Facebook	Committee for Education and Cultural Action (ICOM-CECA)	https://www.facebook.com/icomceca	22-07-2011
Twitter	Education Department at the Milwaukee Public Museum. @MPMEducation	https://twitter.com/mpmeducation	03-2015
Twitter	Education Department at Virginia Museum of History & Culture @VMHCeducation	https://twitter.com/VMHCeducation	04-2011
Twitter	Autry Education @AutryEd	https://twitter.com/autryed	05-2014
Twitter	L'ADM, Associazione Didattica Museale, dal 1994 è responsabile dei Servizi Educativi del Museo di Storia Naturale di Milano. @assodidattica	https://twitter.com/assodidattica	02-2011
Twitter	UtopikaMente @UtopikaMente	https://twitter.com/utopikamente	02-2014

In order to have some statistical data and metrics to quantify the activities and the ways of social communication of museum education department, we collected some metrics directly from Facebook and Twitter and then we used a specific software developed by the German software house Karma, called Fanpage (www.fanpagekarma.com).

Fanpage Karma is an online tool for social media analytics and monitoring. It allows social media companies to engage users (called *fans*) better and reach a growing community in the social networks. Fanpage Karma provides valuable insights also for academic researchers on posting metrics, strategies and performance of social media profiles like Facebook, Twitter or YouTube. Unfortunately, Fanpage Karma allows its users to collect data only for the last 28 days if they are not the administrator of the Facebook page or of the Twitter account. So hereafter we will present some metrics gathered from the 14th of August to the 10th of September 2018.

Twitter metrics

For twitter in particular, we collected how many tweets they posted since their creation, how many followers and following accounts they have, how many likes they obtained and if the account was enlisted in a user created list.

Table 2: Twitter accounts data at Sept. 2018.

Account	Tweet	Following	Follower	Likes	List
@MPMEducation	663	530	373	214	-
@VMHCeducation	1078	431	533	163	1
@AutryEd	135	264	161	57	-
@assodidattica	3177	314	431	396	-
@UtopikaMente	582	760	376	4	2

These statistics demonstrated that there is a significant difference in popularity and online interaction as far as the Museum and its Education Departments' accounts are concerned. On Twitter, for example, the Milwaukee Public Museum main account (@MKEPublicMuseum) has 4,502 tweets, 13,900 followers and 3,885 likes while its Education Department account

ISBN 978-615-5511-25-7

shows 663 tweets, 373 followers and 214 likes obtained by. The @MPMEducation is less active (since 2015) than the main account (since 2009) with around 221 tweets per year against 643 tweets per year; on the latter, it is very far from the twitter-famousness of its main cousin with less than 3% of its followers.

Thanks to Fanpage karma, we tried to collect some valuable metrics like tweets/day, number of likes, engagement, retweets for each Twitter account considered. Unfortunately, there was not enough activity in the timeframe considered.

	Profile Performance Index	Average Weekly Growth	Tweets	Tweets/day	Number of likes	Retweets	Engagement	Conversations
ADM	n.a.	n.a.	2	0.07	0	0	0%	0%
Autry Education	n.a.	n.a.	0	0	0	0	0%	0%
MPM Education Dept.	n.a.	n.a.	1	0.04	4	0	0.039%	0%
UtopikaMente	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
VMHC Education	n.a.	n.a.	0	0	0	0	0%	0%
Average values	n.a.	n.a.	1	0.03	1	0	0.0099%	0%

Figure 1. Twitter accounts statistics (from 14/08/18 to 10/09/18)

Facebook metrics

Using Fanpage Karma, we collected some valuable statistics related to the Facebook pages considered. Not all the Facebook pages considered where directly linked to a specific museum: 9 out of 13 were related to associations of Museum Educators, nevertheless these pages are actually disseminating valuable information about educational activities and educational events in various local museums.

We considered the following metrics:

- number of fans,
- engagement,
- post interaction,
- posts per day,
- number of posts,
- comments on posts by fans,
- number of likes,
- number of shares,
- likes per post,
- comments per post,
- shares per post.

The interpretation of these statistics could not lead to clear conclusions and needs further study. Is seems evident that more followers guarantee a higher post interaction rate, but it

ISBN 978-615-5511-25-7

does not seem enough to have a huge number of followers in order to have more likes and more comments. On the other side, more posts per day are likely to gain more likes than less posts per day, but it is not also true for the number of comments that is variable.

Without a more detailed analysis of the content of the posts it is very unlikely to establish a correct relation between these metrics.

	Number of fans	Engagement	Post interaction	Posts per day	Number of posts	Comments on posts by fans	Number of Likes	Number of Shares	Number of Comments	Likes per post	Comments per post	Shares per post
Committee for Education and Cultu...	5.1k	1.00%	5.6%	0.2	5	0	243	969	4	49	0.8	194
Connecticut Museum Educator Rou...	213	0%	0%	0	0	0	0	0	0	0	0	0
EDUC.a	3.2k	1.3%	1.8%	0.8	21	0	900	167	8	43	0.4	8.0
Fitzwilliam Museum Education Dep...	1.3k	0.12%	0.43%	0.3	8	0	25	18	2	3.1	0.3	2.3
Georgia Museum Educators	185	0%	0%	0	0	0	0	0	0	0	0	0
Greater Boston Museum Educators ...	340	0%	0%	0	0	0	0	0	0	0	0	0
Museum Education Roundtable	4.4k	0.33%	1.1%	0.3	8	0	201	96	6	25	0.8	12
Museum Educators of Puget Sound	269	0.31%	1.8%	0.2	5	0	14	2	1	2.8	0.2	0.4
Museum Educators of Southern Cal...	748	0.34%	0.19%	1.8	51	0	52	4	1	1.0	0.02	0.08
MUVE Education	4.0k	0.79%	0.67%	1.2	33	0	632	128	61	19	1.8	3.9
National Art Education Association	21k	0.034%	0.14%	0.3	7	0	121	61	4	17	0.6	8.7
Sed - Centro per i servizi educativi d...	3.4k	0.12%	0.091%	1.3	36	0	83	19	3	2.3	0.08	0.5
Sistema Museale Civico Foggia - se...	885	0%	0%	0	0	0	0	0	0	0	0	0
Average values	3.4k	0.34%	0.91%	0.5	13	0	175	113	7	12	0.4	18

Figure 2. Facebook pages statistics (from 14/08/18 to 10/09/18)

In order to obtain a more in-depth view of these pages, we decided to focus on one case to explore the relation between these metrics, the contents and the communication efficacy of these pages. Despite its low number of fans (respect other pages considered), MUVE Education is one of the most *liked* (the second after EDUC.a), one of the more active with 12 posts per day (after Museum Educators of Southern California with 18) and it is the most *commented* in our list for the timeframe considered with 61 comments.

The MuVe case

Hereafter we propose some in depth analyses on an exemplary case of museum education for teacher: The MuVe Education Department of Musei Civici di Venezia Foundation (http://www.visitmuve.it). This foundation was created in 2008 and its main purpose is to organize and manage the heritage inheritance of civic museums of Venice, in Italy.

We choose their Education Department since it is one of the best practices in Italy for what concerns social media use and it involved several schools and teachers in their events and activities. MuVe Education represents the educational approach of MuVe and it involves the

ISBN 978-615-5511-25-7

students, making them participants and protagonists, trying to enhance interaction and dialogue, within the framework, however, of rigorous didactic and educational objectives, of particular attention to interdisciplinary connections and inclusion. This approach has been used to design over sixty proposals for schools, active in the civic museums of Venice, all of which are calibrated in relation to the different school groups and the multiple needs for in-depth study. The MuVe programme for the school year includes in each museum and in some temporary exhibitions active paths and workshops. Applying criteria and methods of active pedagogy, the workshops propose experiments and manual activities that allow an immediate approach to techniques or artistic, scientific, compositional peculiarities always deeply connected to the museum or exhibition in which they take place, and that it would be difficult and unproductive to propose only in theory.

Moreover, MuVe Education works also into the schools and higher education institutes: MuVe operators go to the school or in the University and carry out workshops or in-depth activities there. With a methodology inspired by the criteria of action-research, in which theory and educational practice are inseparable moments, the proposals are configured simultaneously as experience and practical experimentation for student and as training activities for teachers, to whom know-how is transmitted according to a shared project, allowing the immediate verification of the effectiveness of the method. Lastly, MuVe Education participates in several academic project with major Italian Universities.

First of all, we decided to analyse the content of the MuVe Education posts. Using Fanpage Karma, we gathered all the posts from 14th of August to 10th September 2018. From the data, it appears very clear that the most commented messages are the ones related to content that directly involve the *fans*: for example, one of the most commented is the one related to the #MuveContest hashtag, a contest where MuVe museums users were asked to participate.

ISBN 978-615-5511-25-7

Message	Type	Date	Likes	Comments	Shares
Ci prepariamo ai festeggiamenti di Ferragosto.... ??	photo	14 Aug 2018	28	2	0
Il giorno di Ferragosto è tradizionalmente dedicato alle gite fuori	photo	15 Aug 2018	7	1	1
Cari amici il 20 agosto ritorna l'appuntamento con il #MuveContest	photo	16 Aug 2018	13	1	4
Cari amici vi piacerebbe visitare, in un percorso davvero speciale,	photo	17 Aug 2018	32	3	7
Cari amici avete partecipato ad una nostra attività didattica?	photo	18 Aug 2018	3	0	0
La prima sala della sezione paleontologica del Museo di Storia	photo	19 Aug 2018	14	0	3
#MuveContest	photo	20 Aug 2018	25	14	3
Cari amici venerdì e sabato sera l'appuntamento fisso è con "Musei	photo	21 Aug 2018	7	0	3
Cari amici molti di voi, pur avendo messo il mi piace alla nostra	photo	22 Aug 2018	10	0	0
#Muvecontest @ #PalazzoDucale	photo	23 Aug 2018	12	0	2
Cari amici la coloratissima mostra "Epoca Fiorucci" vi aspetta a Ca'	photo	24 Aug 2018	8	0	4
Oramai ci siamo: è tutto pronto!! ??	photo	25 Aug 2018	20	0	1
????Tanti auguri a noi!!! ????	photo	26 Aug 2018	81	32	12
#MuveSummerCamp – Diario di bordo	photo	27 Aug 2018	19	0	1
#MuveSummerCamp – Diario di bordo	photo	28 Aug 2018	8	0	3
#MuveSummerCamp – Diario di bordo	photo	29 Aug 2018	11	0	4
#MuveSummerCamp – Diario di bordo	photo	30 Aug 2018	17	0	6
#MuveSummerCamp – Diario di bordo	photo	31 Aug 2018	15	1	1
Cari amici domani a Venezia ci sarà la Regata Storica,	photo	01 Sep 2018	24	1	14
Cari amici anche quest'anno la Fondazione Musei Civici Venezia	photo	02 Sep 2018	17	0	8
La mostra "PRINTING R-EVOLUTION 1450-1500. I cinquant'anni che	photo	03 Sep 2018	17	1	13
Al via la seconda settimana di Summer Camp con i nostri	photo	03 Sep 2018	13	0	0
Cari amici ci siamo: domattina, dalle 10 alle 18, dopo gli ultimissimi	photo	03 Sep 2018	26	1	1
EduDay 2018	photo	04 Sep 2018	44	2	1
#MuveSummerCamp – Diario di bordo	photo	04 Sep 2018	11	0	0
Cari amici l'EDU DAY 2018, giornata di presentazione dell'offerta	photo	05 Sep 2018	27	0	7
#MuveSummerCamp – Diario di bordo	photo	05 Sep 2018	12	0	0
Cari amici ieri a Ca' Pesaro - Galleria Internazionale d'Arte	photo	06 Sep 2018	15	0	3
#MuveSummerCamp – Diario di bordo	photo	06 Sep 2018	9	0	0
#MuveSummerCamp – Diario di bordo	photo	07 Sep 2018	13	0	5
Cari amici è aperta al pubblico la grande mostra "Tintoretto 1519-	photo	08 Sep 2018	52	0	19
Cari amici, come sapete, il 27 agosto abbiamo festeggiato il	video	09 Sep 2018	12	1	1
Iniziare la settimana in tranquillità? ...Noi?!?!	photo	10 Sep 2018	10	1	1

Figure 3. Complete post list by MUVE Education (from 14/08/18 to 10/09/18)

Then we analysed the most frequently used hashtags: a part from some self-referring hashtags (like #muveeducation); general hashtags (e.g. #ferragosto, #asl, #bambini); we found two other types of hashtags. The first one is referring directly to the place where a MuVe event was to be held (e.g. #carezzonico, #palazzomocenigo), the second one is a hashtag created specifically for the event (e.g. #muve4family, #muveeduday, #muvemoonlight).

We strongly believe that the creation of one hashtag per event is a very fruitful strategy to promote events though the shares, repost and newly created posts directly made by the users.

ISBN 978-615-5511-25-7

Figure 4. Most frequently used hashtags by MUVE Education (from 14/08/18 to 10/09/18)

Moreover, we tried a first quantitative approach analysing the word frequency list ordered by the use in the posts by MUVE Education. Excluding the hashtags (the hash # is removed to obtain this kind of analysis so the hashtags are transformed in plain words), we did not find any particular lexicon used in the MUVE Education posts.

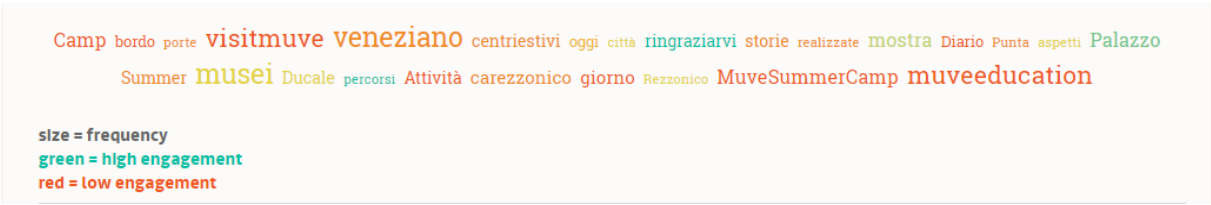


Figure 5. Most frequently used words by MUVE Education (from 14/08/18 to 10/09/18)

Conclusions, limitations and further developments

Notwithstanding that this preliminary study provides interesting theoretical implications, our research has several limitations. First of all, there is a small number of accounts considered, we strongly believe that contacting directly each major museum we could find other education department accounts. Secondly, we need to extend the timeframe considered in order to have more data to discuss.

Our preliminary results confirm what is already discussed and demonstrated in literature, for example by Quinton and Fennemore (2013), that museums unfortunately fail to exploit social media in order to obtain a bidirectional communication between the museum and the visitor. Even if this is changing for the main museums accounts, our preliminary research findings

ISBN 978-615-5511-25-7

demonstrates that this trend is not valid for Museum Education Departments' social accounts. It is not so common to have a dedicated account for the educational services at the museum and, if they are present, they have lower echo among visitors than their major cousins.

Going in depth in one case makes us believe that further analyses are required in order to link communication strategies with the content of educational posts. This way a more successful impact in museum's communication could be reached,

References

1. Arends, M., Goldfarb, D., Merkl, D., & Weingartner, M. (2009, September). Interaction with art museums on the web. *Proceedings of the IADIS Int'l Conference WWW/Internet*, 117-125.
2. Ascenzi, A., & Patrizi, E. (2014). School museums, museums of education and historical educational heritage. A discussion from the experience of the "Paolo and Ornella Ricca" School Museum of the University of Macerata. *History of Education & Childrens Literature, 9*(2), 685-714.
3. Catizone, F. (2015). *Didattica Museale e Venezia. Origini, sviluppi e tendenze attuali* (Bachelor's thesis, Università Ca'Foscari Venezia).
4. Chin, C.C. (2004). Museum experience – A resource for science teacher education. *International Journal of Science and Mathematics Education, 2*(1), 63-90.
5. Jafari, A., Taheri, B., & vom Lehn, D. (2013). Cultural consumption, interactive sociality, and the museum. *Journal of Marketing Management, 29*(15-16), 1729-1752.
6. Lepouras, G., & Vassilakis, C. (2004). Virtual museums for all: employing game technology for edutainment. *Virtual Reality, 8*(2), 96-106.
7. Marty, P. F. (2008). Museum websites and museum visitors: digital museum resources and their use. *Museum Management and Curatorship, 23*(1), 81-99.
8. Pigozzi, M. (2016). Conoscere per preservare e valorizzare il nostro patrimonio culturale. *INTRECCI d'arte, 5*(5).
9. Quinton, S., & Fennemore, P. (2013). Missing a strategic marketing trick? The use of online social networks by UK charities. *International Journal of Nonprofit and Voluntary Sector Marketing, 18*(1), 36-51.
10. Poce, A., & Re, M. R. (2017). *Tecnologia critica e didattica museale.* Il progetto Erasmus+ DICHE. Le ragioni di Erasmus, 1.
11. Venkatesh, A., & Meamber, L. A. (2006). Arts and aesthetics: Marketing and cultural production. *Marketing Theory, 6*(1), 11-39.
12. Vassiliadis, C., & Belenioti, Z. C. (2015). Museums and cultural heritage via social media: An integrated literature review. *Tourismos: An International Multidisciplinary Journal of Tourism.*

ISBN 978-615-5511-25-7

13. Weilenmann, A., Hillman, T., & Jungselius, B. (2013, April). Instagram at the museum: communicating the museum experience through social photo sharing. *Proceedings of the SIGCHI conference on human factors in computing systems*, 1843-1852. ACM.

Acknowledgement

A. Poce coordinated the research presented in this paper. Research group is composed by the authors of the contribution that was edited in the following order (A. Poce: Introduction, Conclusions, limitations and further developments; F. Agrusti: Methodology, Facebook metrics, Twitter metrics; S. Trasolini: The MuVe case).

ISBN 978-615-5511-25-7

Towards Personalized Guidance and Support for Learning
Proceedings of the 10th European Distance and E-Learning Network Research Workshop, 2018
Barcelona, 24-26 October, 2018
ISBN 978-615-5511-25-7

FUTURE OF LEGAL EDUCATION

Ausrine Pasvenskiene, Paulius Astromskis, Vytautas Magnus University, Lithuania

Proposal for poster presentation

Globalization and unprecedented technological development have led to unprecedented legal challenges. The concepts of property, personality and actions changes fundamentally due to the rapid (r)evolution of artificial intelligence systems; exponentially growing data volumes and possibilities to store and process them; autonomous and robotic technologies; just a few to mention These changes require a new approach to all areas of law. The existing legal system is designed to regulate human-human (*in personam*) and human-machine (*in rem*) relations, thus it is not entirely appropriate to regulate the machine-human or machine-machine relations.

In addition, rapid development of legal technologies (LegalTech), powered with artificial intelligence, has already caused and continues to drive market shocks to the legal profession (Mountain, 2007). As a result, lawyers with a higher education are continuously replaced by technological solutions. However, this unprecedented development of LegalTech also creates many new business opportunities and demand for the new generation hybrid professions – legal technologists, legal projects managers, just a few to mention (Susskind, 2008; 2013). Moreover, it also requires a new generation of interdisciplinary legal training, skills and knowledge. That is, technological (r)evolution requires not only next generation of law, but also the next generation of lawyers.

Unfortunately, however, a lot of legal studies are still organized according to the conservative model, essentially unchanged from the times of Charles Dickens. Usually it requires a lot of space for classical law studies, leaving relatively little space for the studies (as an integral part) of certain other fields – philosophy, information technology, economics, and others. Moreover, the ecosystems for LegalTech start-ups are also underdeveloped.

Obviously, the shortages of technology law and legal technologies study programs, underdeveloped legal entrepreneurship ecosystems, in the context of global technological developments, is a practical problem. However, this problem has attracted the attention of researchers from various fields as well (Tegmark, 2015; Leenes & Lucivero, 2014). Integrity of law and technologies is a new interdisciplinary research field. Therefore, identification and analysis of the specific needs of new generation lawyers, architecture of technologies law and legal technologies study programs and ecosystems is a new scientific problem too.

Solution of these problems requires a creation of an interdisciplinary model of technologies law and legal technologies studies. The model should be extended beyond the issues of content and management. What should be the relationships between learners and/or teachers? What communication, assessment, feedback tools should be used? What regulation and ecosystem should be built to maximize the career opportunities for the future lawyers, studying under the high degree of future uncertainty? These issues clearly require a research.

Therefore, *the purpose* of this research is to develop the conceptual model of technologies law and legal technologies studies which integrates the variables of content, behaviour and ecosystem, and which within the limits of the regulatory discretion would maximize the career opportunities for the future lawyers.

Proposed poster will present the initial research results within four major research *objectives*. First, we will review the technologies law and legal technologies study programs offered by European Union universities, in the context of their content, behaviour, and ecosystems. Second, we will summarize the trends of technology law and legal technology studies in the context of the future developments of a legal profession. Third, we will substantiate the conceptual model of technologies law and legal technologies studies which would maximize the career opportunities for the future lawyers. Finally, we will recommend changes to the current regulation of legal studies.

References

1. Leenes, R., & Lucivero, F. (2014). Laws on Robots, Laws by Robots, Laws in Robots: Regulating Robot Behaviour by Design. *Law, Innovation and Technology, 6*(2), LIT 194–222.
2. Mountain, D. R. (2007). Disrupting Conventional Law Firm Business Models Using Document Assembly. *15 Int'l J.L. & Info. Tech.*, 170.
3. Susskind, R. (2008). *The end of lawyers?* (1st ed.). Oxford: Oxford University Press.
4. Susskind, R. (2013). *Tomorrow's lawyers: An introduction to your future.* Oxford: Oxford University Press.
5. Tegmark, M. (2015, October 27). Research Priorities for Robust and Beneficial Artificial Intelligence. An Open Letter. Future of Life Institute [Blog post]. Retrieved May 2, 2017, from https://futureoflife.org/ai-open-letter

ISBN 978-615-5511-25-7

Towards Personalized Guidance and Support for Learning
Proceedings of the 10th European Distance and E-Learning Network Research Workshop, 2018
Barcelona, 24-26 October, 2018
ISBN 978-615-5511-25-7

TEACHERS' TRAINING ON CRITICAL THINKING TEACHING STRATEGIES: THE CRITHINKEDU EXPERIENCE

Antonella Poce, Francesco Agrusti, Maria Rosaria Re, Roma Tre University, Italy

Summary

Nowadays, Critical Thinking (CT) education is of crucial importance for universities in the preparation of students in every field of study. The present article describes the state of the art of lecturing training experience in general and in more specific scenarios, such as training at the Department of Education of Roma Tre University (IT). Furthermore, using both quantitative and qualitative research methodologies, we report the experience of the design and conception of a training course on the quality assurance criteria when delivering CT teaching as part of the activities of the EU funded "Critical thinking across European higher education curricula – CRITHINKEDU" project. Within the module, each project partner institution was engaged in several activities to implement active strategies addressed to CT skills teaching. Obtained results from the training and learning activity conducted in the module are finally discussed.

Introduction

In the last fifty years the higher education system, especially in Europe, had to face a huge massification of its services. On the one hand, the worldwide higher education enrolment expansion corresponds to a new model of society: higher qualifications mean much better career perspectives (Altbach, Reisberg, & Rumbley, 2009; Li, John Morgan, & Ding, 2008). On the other, this expansion caused unintended social effects like social mobility stagnation (graduate unemployment and underemployment are everyday more common). As educators and researchers, we need to face this dangerous levelling which causes "flat" learning practices based on common sense (Poce, 2012; 2015; Poce et al., 2017a; 2017b). In this scenario, CT teaching and learning is of pivotal importance in contemporary society, as highlighted by the European Commissions (New Skills for New Jobs, 2010).

In this paper we describe the experience of designing and conceiving a module to foster CT education for HEI in academic courses. This module is one of the core outcomes of the "Critical thinking across European higher education curricula – CRITHINKEDU" project, and it is targeted to the academic networks of each partner institution, who will later replicate the course itself at local level to their teachers, lecturers and tutors interested in implementing CT teaching and learning in their own activities. The main aim of this paper is to provide some insights and best practices concerning the improvement of CT teaching, assessing and learning quality in universities across the curricula.

State of the art

Several studies were conducted on the opportunities to implement CT practices and learning activities in HEI: improving CT skills and dispositions in students is not a matter of implicit expectation but it is of crucial importance to make CT objectives explicit at a micro level (embed CT teaching in already existent courses) and in a macro level (include CT training in staff faculty development) (Abrami et al, 2008; Halpern, 1998; 2001; Tiruneh et al., 2014; Poce, 2017; Poce et al, 2017a; 2017b; Dominguez, 2018a). In literature, there is a consistent amount of intervention studies about CT instruction in HEI (e.g. Bensley & Haynes, 1995; Bensley, Crowe, Bernhardt, Buckner, & Allman, 2010; Solon, 2007; Hitchcock, 2004; Mazer, Hunt, & Kuznekoff, 2007; Plath, English, Connors, & Beveridge, 1999; Reed & Kromrey, 2001; Barnet & Francis, 2012; Renaud & Murray, 2008; Williams, Oliver, & Stockdale, 2004; Toy & Ok, 2012; Poce et al, 2017a, 2017b) and an important number of systematic reviews which attempted to analyse the evidence on CT teaching in HEI (e.g., Abrami et al., 2008; Behar-Horenstein & Niu, 2011; Ten-Dam & Volman, 2004; Tiruneh et al., 2014).

Despite this large body of investigation about CT intervention studies in HEI, it appears that there is a major focus on specific instructional interventions dedicated to students or pre-service teachers (*train-the-student* point of view) and there are only very few relatively recent studies or meta-analysis which tried to investigate interventions dedicated to higher education teachers (*train-the-teacher* point of view). Beyer (2008) proposes several guidelines to teach critical thinking skills in social studies at any grade level and he highlights that student improvement in CT skills should be an essential outcome of the subject taught in class. Moreover, several empirical researches provide the evidence that teaching strategies which encourage the students to acquire thinking skills are crucial for CT development (Beyer, 2008; Halpern, 1993). In literature there are mainly two ways to transfer the acquired thinking skills: teaching in a content-free environment and with a discipline-embedded approach (Halpern, 1998; Nickerson, 1988; Perkins & Salmon, 1988). Tiruneh et al. (2014) highlighted that direct teaching strategies are more effective than explicit ones even if the evidence of their effectiveness is inconsistent (Beyer, 2008; Paul & Elder, 1993).

Research design and methodology

The course involved a vast number of academic teachers, lecturers and tutors from all the European Union: a total number of 65 participants were engaged in the course (counting also the coaches) coming from nine different European countries (Belgium, Czech Republic, Greece, Ireland, Italy, Lithuania, Portugal, Romania and Spain). The course has been held in Italy, at the University of Roma TRE, Department of Education from the 29th of January 2018 to the 4th of February 2018.

The course fundamentals were gathered from the results obtained from previous outputs of CRITHINKEDU project. Mainly the preliminary proposal for the guidelines for quality in CT education were investigated (Dominguez, 2018b; p.57,). Moreover, we intend to provide practical examples and use-cases facing most common problems reported in the interviews conducted in the Output 2 of CRITHINKEDU project.

ISBN 978-615-5511-25-7

The course design was intended to integrate principal gaps between labour market needs and CT educational practices in European HEI. These gaps were identified in the already mentioned Output 2 and we tried to integrate different CT knowledge students' levels into the course methodology. Particular importance was given to the course participants, providing group coaches with clear and specific directions: introduce transversal aspects of CT, facilitate participants' discussions on CT related to their own field of interest, redesign their own course in order to define their students' CT improvement, ask them to make more explicit CT teaching using instructional design principles. Furthermore, coaches were required to drive participants' attention towards the following aspects: CT assessment, time management, classes size and other minor course designing characteristics.

At the end of the course participants should be able to: redesign their own course including CT practices and Output 2 guidelines; generate new ideas inspired with different methods, approaches, practices and tools to foster CT learning at a curricular level; spread the word to encourage their colleagues and institutions to engage with CT.

The course adopted a *train-the-teacher* point of view: it was intended to support teachers, lecturers and tutors on how to introduces effective CT teaching, learning and assessing their courses and not the *train-the-trainer* (of teachers) one.

Design and conception of the training course

At the very beginning of the course conception, the CRITHINKEDU partnership agreed on a common design for the course: several pre-introductory sessions were organized locally by each partner in order to introduce participants to the CRITHINKEDU project and to create a common understanding of CT before the main course. In occasion of these pre-introductory sessions, the Facione's framework (1995) and the Outputs 1 and 2 results were presented.

One of the main aspects of the course design was the content independency requirement: all the theoretical and practical materials have been designed exclusively for HE teachers independently of their field of study. Other aspects have been dealt with in detail like the timeframe and the estimated number of materials per day, the assessment activities and the learning materials for the users' need to be developed and the grouping of the course participants.

Short lasting meetings (maximum 2 hours) were organized at local level by each partner institution involved in order to share a common knowledge base about CT principles and Facione's framework. Moreover, other aims of this local meetings were to present the CRITHINKEDU project to the participants, to know each other, clarify the dispositions and the skills mentioned in the first two project outputs, ask to the participants their motivation and their previous experiences with CT teaching and learning. Additionally, all participants were asked to bring with them their curricular unit materials to redesign them during the course.

Five types of sessions were identified in course designing:

ISBN 978-615-5511-25-7

1. Expectation session: very first session of the day to clarify day goals and activities.
2. Plenary session: a general session with all the participants in one room lasting more than 45 minutes.
3. One or more *hint session*: like the plenary session but shorter (20 minutes, maximum). In this session a plenary discussion about the hints given was mandatory. The above hints should work as a reference for the activity sessions (explained below).
4. Activity session: the core of the day, it lasts 1 hour – 1 hour and half. In this session participants are divided in groups for specific field of study and guided by the coaches through the daily activities.
5. Achievement session: a very short session in which participants, in groups, could consolidate the day thoughts.

In the table below the activity sessions titles per day are reported. Further details are given in the Output 3 report (Dominguez, 2018c).

Table 1: Activities titles per day

Day	Activity
1	What do we want to achieve in our Curricular Unit?
	Activity 1.1 - Identify and clarify learning outcomes
	Activity 1.2 - Assessment needs
2	What do students have to do?
	Activity 2.1 – Task analysis
	Activity 2.2 – Design learning activities
3	How can we support students in CT development?
	Activity 3.1 – Design CT-oriented lesson plans with the integration of questioning and cooperative learning strategies
	Activity 3.2 – Problem-based learning (PBL) and CT
	Activity 3.3 – Experience the VaKE method
4	How can we measure the achievement?
	Activity 4.1 – Deploy your assessment plan and detail CT assessment tasks
	Activity 4.2 – Assessment principles applied to CT
5	Are we all ready to go?
	Final Activity – How to start implementing changes in your Curricular Unit?

To introduce the course a welcome message has been sent to all the participants: beside practical information, a link to a shared folder with all the course materials was provided in order to minimize printed materials.

Course evaluation

At the end of the course, a questionnaire was provided to participants with the aim to assess their satisfaction level. This evaluation tool was composed by 7 questions, as follows: Overall course evaluation (closed question); Course weaknesses (closed question); Content quality evaluation (Likert scale); Methodology, materials and organization quality evaluation (Likert scale); Participants' skills self-evaluation (Likert scale); Possible changes (open-ended question); Comments and suggestions (open-ended question).The questionnaire was filled by

ISBN 978-615-5511-25-7

participants during the last day of the course: 45 participants out of 65 completed the evaluation activities.

In general, about the 70% of participants was completely satisfied with the course. The topics presented were what the participants expected from the training (80%) and met respondents' needs (80%); the subject matter was considered in line with participants' work duties, highlighting the real possibility to use course materials and contents in respondents' future teaching activities. More in details, participants stated they will use course contents and ideas to share critical thinking teaching modalities in their institutions (86%) and they would also recommend the course to others teachers colleagues (75%).

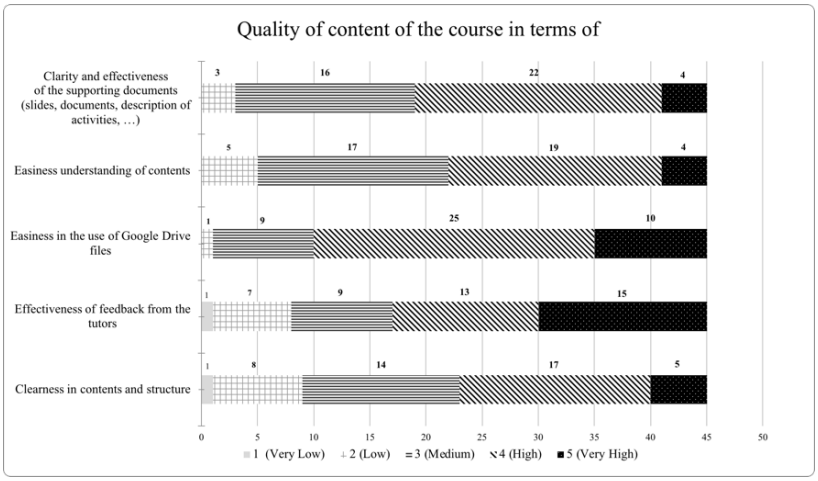


Figure 3. Content quality evaluation

As regards practical aspects, the course had a positive evaluation: the number of participants per group was adequate, the working teams were considered well assembled; the learning environment was considered quite comfortable.

On the other side, some information about CT skills were considered "taken for granted" by 66% of respondents: a deep and complete preparation before the course was considered needed.

As regards the skills self-evaluation activity, participants highlighted the strong promotion of both transversal skills, like collaboration and communication, and teaching skills, such as instructional design and teaching methods. Instead, Leadership and digital skills were not enough developed during the course sessions.

Conclusions

On one hand, the experience carried out in Rome was valuable for team working and it gave the opportunity to exchange experiences among HEI teachers, lecturers and tutors on how to foster CT in everyday teaching activities. On the other, it seems clear that it was not only a simple exchanging experience: based on our results, the participants were very satisfied with the course itself (e.g. 93% of participants enjoyed the plenary sessions). Moreover, the experience proved to be very useful from a professional point of view: more than 86% stated

ISBN 978-615-5511-25-7

that they will reuse ideas and the training acquired once back in their institution; more than the 74% of the participants would recommend the course to other colleagues.

All the above considered, there is more space for improvements: apart from the need for more structured guidelines to foster CT education in HEI courses (already planned as part of the future CRITHINKEDU project developments), teachers demanded more practical examples and strategies on how it is possible to transfer different skills or disposition in their own courses.

Last but not least, CT assessment and evaluation has been highlighted as one of the most crucial aspects in CT education. The assessment of such high-level skills is nowadays a challenge that is still under development.

References

1. Abrami, P. C., Bernard, R. M., Borokhovski, E., Wade, A., Surkes, M., Tamim, R., & Zhang, D. (2008). Instructional interventions affecting critical thinking skills and dispositions: A stage 1 meta-analysis. *Review of Educational Research, 78*(4), 1102-1134.
2. Altbach, P. G., Reisberg, L., & Rumbley, L. E. (2009). *Trends in Global Higher Education: Tracking an Academic Revolution.* Paris: UNESCO.
3. Behar-Horenstein, L. S., & Niu, L. (2011). Teaching critical thinking skills in higher education: A review of the literature. *Journal of College Teaching & Learning, 8*(2), 25-42.
4. Bensley, D., Crowe, D., Bernhardt, P., Buckner, C., & Allman, A. (2010). Teaching and Assessing Critical Thinking Skills for Argument Analysis in Psychology. *Teaching of Psychology, 37*, 91-96.
5. Bensley, D. A., & Haynes, C. (1995). The acquisition of general purpose strategic knowledge for argumentation. *Teaching of Psychology, 22*(1), 41-45.
6. Beyer, B. (2008). How to teach thinking skills in social studies and history. *Social Studies, 99*(5), 196-201.
7. Dominguez, C. (coord.) (2018a). *A European collection of the Critical Thinking skills and dispositions needed in different professional fields for the 21st century.* Vila Real: UTAD. ISBN: 978-989-704-256-0.
8. Dominguez, C. (coord.) (2018b). *A European review on Critical Thinking educational practices in Higher Education Institutions.* Vila Real: UTAD. ISBN: 978-989-704-258-4.
9. Dominguez, C. (coord.) (2018c). *The CRITHINKEDU European course on critical thinking education for university teachers: from conception to delivery.* Vila Real: UTAD. ISBN: 978-989-704-274-4.
10. Facione, P. A. (1990). *Critical Thinking: A Statement of Expert Consensus for Purposes of Educational Assessment and Instruction. Research Findings and Recommendations.* Mellbrae, CA: The California Academic Press.

ISBN 978-615-5511-25-7

11. Hitchcock, D. (2004). The effectiveness of computer-assisted instruction in critical thinking. *Informal Logic, 24*(3), 183-217.
12. Halpern, D. F. (1993). Assessing effectiveness of critical thinking instruction. *The Journal of General Education, 42*(4), 238-254.
13. Halpern, D. F. (1998). Teaching critical thinking across domains, dispo- sitions, skills, structure training, and metacognitive monitoring. *American Psychologist, 53*, 449–455.
14. Halpern, D. F. (2001). Assessing effectiveness of critical thinking instruction. *Journal of General Education, 50,* 270-286.
15. Li, F., John Morgan, W. J. & Ding, X. (2008). The Expansion of Higher Education, Employment and Over-Education in China. *International Journal of Educational Development, 28*(6), 687–697.
16. Mazer, J., Hunt, S., & Kuznekoff, J. (2007). Revising general education: Assessing a critical thinking instructional model in the basic communication course. *The Journal of General Education, 56*(3-4), 173-199.
17. Nickerson, R. (1988). On improving thinking through instruction. *Review of Research in Education, 15*(3), 3-57.
18. Paul, R., & Elder, L. (1993). *Critical Thinking Reading & Writing Test.* Tomales (CA): The Foundation for Critical Thinking.
19. Perkins, D., & Salomon, G. (1988). Teaching for transfer. *Educational Leadership, 46*(1), 22-32.
20. Plath, D., English, B., Connors, L., & Beveridge, A. (1999). Evaluating the outcomes of intensive critical thinking instruction for social work students. *Social Work Education: The International Journal, 18*(2), 207-217.
21. Poce, A. (Ed.) (2012) *Contributions to the definition of a critical technology. An assessment study.* ISBN: 9788820410063. Milano: Franco Angeli.
22. Poce, A. (Ed.) (2015). *Tecnologia critica, Creatività e Didattica della Scienza.* Milano: Franco Angeli.
23. Poce, A. (2017). *Verba sequentur: thinking and writing for a critical development of competences at secondary school.* Milano: F. Angeli.
24. Poce, A., Corcione, L., & Iovine, A. (2012). Content Analysis and Critical Thinking. An Assessment Study. *Cadmo, An International Journal of Educational Research, 1*(12), 47-63.
25. Poce, A., Agrusti, F., & Re, M. R. (2017a). Enhancing Higher Education Students' XXI Century Skills through Co-writing Activities in Science Teaching. *Journal of E-Learning and Knowledge Society, 13*, 27-40.
26. Poce, A., Agrusti, F., & Re, M. R. (2017b). Use of webcasting and development of critical thinking skills. In J. Domenechi Soria, Vincent Vela M. C., de la Poza Desam- parados

ISBN 978-615-5511-25-7

Blazquez E. (Eds.), *HEAd'17. 3rd International Conference on Higher Education Advances. Proceedings* (pp. 882-890). Valencia: Editorial Universitat Politècnica de València.

27. Reed, J., & Kromrey, J. (2001). Teaching critical thinking in a community college history course: Empirical evidence from infusing Paul's model. *College Student Journal, 35*(2), 201-216.
28. Renaud, R. D., & Murray, H. G. (2008). A comparison of a subject-specific and a general measure of critical thinking. *Thinking Skills and Creativity, 3*(2), 85-93.
29. Solon, M. (2007). Generic critical thinking infusion and course content learning in introductory psychology. *Journal of Instructional Psychology, 34*(2).
30. Ten-Dam, G., & Volman, M. (2004). Critical thinking as a citizenship competence: Teaching strategies. *Learning and Instruction, 14*, 359-379.
31. Tiruneh, D.T., Verburgh, A., & Elen, J. (2014). Effectiveness of critical thinking instruction in higher education: A systematic review of intervention studies. *Higher Education Studies, 4*(1).
32. Toy, B., & Ok, A. (2012). Incorporating critical thinking in the pedagogical content of a teacher education programme: Does it make a difference? *European Journal of Teacher Education, 35*(1), 39-56.
33. Williams, R. L., Oliver, R., & Stockdale, S. (2004). Psychological versus generic critical thinking as predictors and outcome measures in a large undergraduate human development course. *The Journal of General Education, 53*(1), 37-58.

Acknowledgment

Research group is composed by the authors of the contribution that was edited in the following order A. Poce (Introduction), F. Agrusti (State of the Art, Research Design and Methodology, Design and conception of the training course, Conclusions), M.R. Re (Course evaluation).

ISBN 978-615-5511-25-7

Towards Personalized Guidance and Support for Learning
Proceedings of the 10th European Distance and E-Learning Network Research Workshop, 2018
Barcelona, 24-26 October, 2018
ISBN 978-615-5511-25-7

NETWORK LEARNING ENVIRONMENTS: INTEGRATING AN ONLINE LEARNING MODEL WITH THE WORDPRESS PUBLISHING MODEL FOR THE TEACHING-LEARNING OF GRAPHIC DESIGN AND ARTS

Quelic Berga, Laia Blasco, Javier Melenchón, Universitat Oberta de Catalunya (UOC), Spain

Summary

With the creation of the *Grado de Diseño y Creación Digital* and the *Grado de Artes*, the *Universidad Oberta de Catalunya (UOC)* has started to implement improvements in its virtual campus to allow students to work with visual elements. Several surveys and pilot tests have been carried out over the last four years with the aim of solving the need for students to show their visual creations online. We have developed a system that bridges student's classroom with their own university e-portfolio, allowing accompaniment and continuous evaluation and at the same time following the professional standards to allow an easy migration towards a professional e-portfolio. We show an efficient way to integrate the online learning environment of the *UOC* with the open source culture of *WordPress* respecting its values, methods and standards.

Introduction: Students e-portfolios and professional e-portfolios

An e-portfolio is a digitized collection of artifacts including demonstrations, resources, and accomplishments that represent an individual, group, or institution. This collection can be comprised of text-based, graphic, or multimedia elements archived on a Web site or on other electronic media (Lorenzo & Ittelson, 2005). But the full impact of e-portfolios is realized when the author(s) and others reflect on the content (Reese & Levy, 2009). When used in learning environments, its use contributes to the development of students' transformative capabilities: autonomy, reflexivity, critical thought, creativity and cooperation, amongst others (Pires et al., 2018).

Student e-portfolios were born out of faculty-assigned, print-based student portfolios dating back to the mid-80s (typically in art-related programs and in disciplines with significant writing components, such as English and communication studies) and gained prominence in higher education during the mid-90s. In the printed mode, as well as in today's electronic mode, students basically collected their work, selected examples to showcase, and reflected on what they learned (Lorenzo & Ittelson, 2005).

In visual arts context, there is an extensive tradition of professional portfolios. These are tools for documentation, dissemination and socialization of the main projects of a study or an

author and serve to demonstrate the capabilities of professional development and implementation. What is lacking is research that provides insights into how a portfolio for learning can be used in Higher Education to develop understanding into one's own learning, assessment and professional practices (Klenowski et al., 2006).

This project is being tested in the *Universitat Oberta de Catalunya (UOC)* environment (Sangrà, 2002), a fully online university. *UOC* has a student centred pedagogical model that ensures a guided learning path through the use of curated resources, according to the experience of a team composed by instructional designers, usability experts and, of course, teachers. In the e-learning context, constant teaching presence is essential in both group and classroom spaces, where online teachers constantly monitor each group and constantly communicate with them, designing, facilitating and promoting educational experience (Garrison, Anderson, & Archer, 2001).

Context and background

The *Grau de Disseny i Creació Digitals* (Bachelor in Design and Digital creations) was conceived between 2014 and 2015 and opened to the students during 2016. The *Grau en Arts* (Bachelor in Arts) followed the same development, starting the process one year later and opening in 2017.

Both degrees need technological solutions to share, discuss and organize students visual and graphical outcomes, While the *UOC* already has experience dealing with this type of graphical evidences through the *Grau de Multimedia* since 1999, it still has no tools or systematized methodologies for the submission, publication and evaluation of visual and graphical content done by students. Consequently, the university considers the use of a model of student e-portfolio (Lorenzo & Ittelson, 2005) to solve this need.

DesignIt conceptualization and MyDocumenta case study

In 2015, the company DesignIt, specialized in user experience, was hired to conduct a research and to collect the core needs. They presented several documents and a proposal of a wireframe. During the first semester of 2017, an adapted version of MyDocumenta tool (MyDocumenta, 2018) took over and an adaptation of the original tool was forked to adapt to the core needs. This process was analysed later, giving two clear results: there is a real need for e-portfolio tools in both degrees, and the given tool was not fulfilling the aims for the e-portfolio because it did not follow seamlessly the university learning model, nor the professional ways of doing e-portfolios.

Table 1: Detected needs during DesingIt conceptualization and MyDocumenta pilot tests

Subject	University Staff (PRA, PDC, Tutor@s)	Students
Needs	To keep the teaching-learning workflow in a centralized and easy to monitorise space following the university methods.	Develop personal projects (as if it would be in a physical workshop) with the support of the university environment.

ISBN 978-615-5511-25-7

Enhance tools to communicate with the student when discussing about graphical or visual outcomes.	Ability to submit multimedia outcomes.
Tools to evaluate visual and graphical outcomes and capacity to give visual feedback to students.	Get visual and graphical feedback from the teachers and colleagues.
Promote the role of the teacher as a facilitator and to empower peer learning processes.	Tools for online team working.
To be aligned with the professional sector and the market.	Creation of the professional e-portfolio as an evidence of the learning process.

UOCFolio: A WordPress e-portfolio adapted for the Online Teaching-Learning Environment

Once reached those conclusions and needs, taking in consideration our expertise in interface design and in online teaching, we made a proposal in which instead of developing a new tool or method from scratch, it was possible to connect two existing models that have proven their success. On the one hand, the distance learning model of the *UOC*, and on the other, the content management system (CMS) *WordPress*. *WordPress* was chosen for its wide use on the web (Builtwith, 2018) as well as for its popular use by professional designers and artists.

Plugins to integrate two models

Instead of modifying the *UOC* learning model or modifying the *WordPress* core system by altering its main code, we opted for the concept of designing connectors that use the OpenAPI of the *UOC* and are integrated non-invasively into the *WordPress* workflow. To do so, we are launching a pilot test of Students *WordPress* e-portfolios that are integrated into the *UOC* learning environment.

For the project, we decided to use a *MultiWordPress* install so the maintenance of the whole system can be done in a centralized way. On the other hand, we have developed a system to authenticate students with their *UOC* campus login to have all the data synchronized. In this way, each student has their own *WordPress* connected with their profile and activity in the university.

NetUOC plugin

One of the main challenges was to effectively combine the different work spaces within the student's personal e-portfolio. A publication system has been designed to allow six levels of granularity when publishing the work: Private, Visible to teaching staff, Visible in the *agora* of the classroom, Visible to the *UOC* community, Only visible with password and Public. This system allows the student to decide if it is a personal work space, if it is a shared space with the teaching staff, the virtual classroom, the campus or the public on the internet (see Figure 1).

ISBN 978-615-5511-25-7

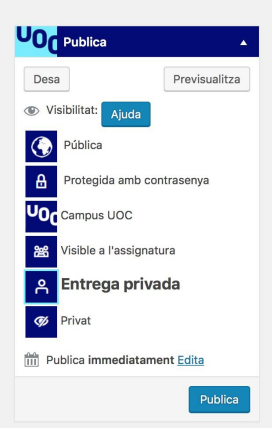


Figure 1. NetUOC plugin substitutes the standard WP publishing box to allow for the UOC publication granularity

ActiUOC plugin

At *UOC,* each classroom has a timeline and several activities to follow-up along the semester. A connector that follows both, the *WordPress* category model and the continuous assessment system of the *UOC*, has been developed to link both models. As seen in Figure 2, a box with a list of activities per classroom in which the student is enrolled is automatically created. The student is asked to tag their related outcomes with the right activity category for later assessment and correct sharing.

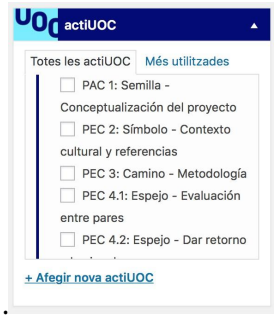


Figure 2. ActiUOC allows students to assign their actual ongoing assignments to their e-portfolio posts. The look and feel respects and follows the category system by WordPress.

AGORA blog

The classrooms Agora is an automatically generated blog, accessible from a link found in the virtual classroom, that gathers all the works of the classmates in a unique space. Like an exhibition space, it is also facilitating discussions around those course activities. Each time a student publishes a content tagged as an activity associated to the course, and only if it is defined as visible, at least, for the classmates it appears automatically to that blog.

It should be noted that these Agoras only show all their content if the visitor belongs to the right classroom. Still, tutors, staff and students, by assigning more open view permissions using the netUOC plugin, can set-up virtual shows for the colleagues of the campus or public views of the work done during the course for the general audience.

ISBN 978-615-5511-25-7

ForumLink plugin

After what was learned during the *MyDocumenta* pilot, it was decided not to decentralize debate spaces and prioritize the UOC model over other ways of giving feedback. ForumLink allows classroom members to open debate threads or follow them in case they have already been opened in relation to contents published in students' portfolios inside the forum space of the virtual classroom. Instead of opening a teaching debate in the student's space, we keep the conversation in the forums of the classroom where other colleagues can learn from the debate and participate, while keeping the *WordPress* possibility of making comments as a visitor in the posts.

Results

Taking into account the importance and usefulness of the professional artistic e-portfolio in the areas of design and art, one of the skills that students must have is the ability to build their own e-portfolio. Learning and becoming familiar with the *WordPress* environment, that follows the open web standards and shows a huge flexibility to adapt to each user, becomes part of the learning process of the students.

Moreover, in a e-learning environment, it is essential that teachers have access to the artworks generated by the student, together with the ability to assess and evaluate these evidences throughout the course. It is also relevant that students access their classmates' outcomes to learn, discuss, engage and comment on the work of others. This is achieved by using the ForumLink plugin allows to debate about the outcomes in the classroom and by automatically sharing all the visual content with the classmates thanks to the *Agora* system.

With the aim to keep both models independent but unite, a series of connectors are implemented that, visually, create a bridge between the design of the university and that of the *WordPress* platform. Both the technical treatment and the design have been developed with the intention of clearly defining this symbiotic relationship.

Finally, the objective is to consider the value of both working models. On the one hand, maintain and enhance the learning model based on the accompaniment and flexibility that asynchronism and ubiquitous access suppose. On the other hand, implement solutions that respect the open source model and follow the *WordPress* codex (WordPress, 2018), taking advantage of and also putting in value the popularity and professional use of the tool. As a university we also take in consideration its capacity to empower decentralization, freedom and autonomy of its users, as well as the enormous capacity for growth and adaptation based on the use of non-centralized by a market plugin.

Therefore, we conclude that in online artistic studies it is important to have technological tools throughout the training program that help students build their own artistic portfolio while discussing the outcomes with classmates and teachers. The seamless integration between both, the campus and the e-portfolio, is essential for the creation of the proper learning environment, and the future ability of the students to create their own professional portfolio.

ISBN 978-615-5511-25-7

References

1. Anderson, T., Liam, R., Garrison, D. R., & Archer, W. (2001). *Assessing teaching presence in a computer conferencing context.*
2. Builtwith main webpage (2018) Retrieved from https://trends.builtwith.com/cms
3. Klenowski, V., Askew, S., & Carnell, E. (2006). Portfolios for learning, assessment and professional development in higher education. *Assessment & Evaluation in Higher Education, 31*(3), 267-286.
4. Lorenzo, G., & Ittelson, J. (2005). An overview of e-portfolios. *Educause learning initiative, 1*(1), 1-27.
5. MyDocumenta main webpage (2018) Retrieved from http://www.mydocumenta.com/
6. Pires, A. L. D. O., Rodrigues, M. D. R., & Pessoa, A. M. (2018). Transforming pedagogy in higher education. *HAMK Unlimited Journal*, 1-11.
7. Reese, M., & Levy, R. (2009). *Assessing the future: E-portfolio trends, uses, and options in higher education.*
8. Sangrà, A. (2002). A new learning model for the information and knowledge society: The case of the Universitat Oberta de Catalunya (UOC), Spain. *International Review of Research in Open and Distance Learning, 2*(2). Retrieved from http://www.irrodl.org/index.php/irrodl/article/view/55
9. Universitat Oberta de Catalunya. Conoce la UOC, hechos y cifras. In the UOC webpage (online) [accessed on July 9, 2018] http://www.uoc.edu/portal/es/universitat/coneix/fets-xifres/index.html
10. WordPress codex webpage (2018) Retrieved from https://codex.wordpress.org/

ISBN 978-615-5511-25-7

Towards Personalized Guidance and Support for Learning
Proceedings of the 10th European Distance and E-Learning Network Research Workshop, 2018
Barcelona, 24-26 October, 2018
ISBN 978-615-5511-25-7

LEARNING ECOLOGIES ORIENTED TO THE PROFESSIONAL DEVELOPMENT OF UNIVERSITY TEACHERS

Mercedes González-Sanmamed, Universidade de A Coruña, Albert Sangrà Morer, Universitat Oberta de Catalunya, Alba Souto-Seijo, Francisco Santos Caamaño, Iris Estévez Blanco, Universidade de A Coruña, Spain

Summary

At present, the need for lifelong learning has become an unavoidable requirement both personally and professionally to enable access to new knowledge generated in a vertiginous way in the information society. Thanks to technology, opportunities have been increased and forms and times to acquire the skills needed to function as a citizen and worker of the 21st century to have been extended. This framework has generated the concept of learning ecologies, which allows analysing the processes, mechanisms, and resources that a person has been generating in their life trajectory and of which they have to continue learning. Under these premises, we are developing research in which we analyse the learning ecologies of university teachers to reveal their main components and find out the learning formats, both formal, non-formal and informal, that they are using for their learning and professional development as teachers.

Quality of higher education and teacher professional development

Higher education faces important challenges to be able to respond to the expectations that, from the political, socio-cultural, economic and scientific level, have been raised about the contributions that universities have to offer to society in general and their graduates in particular. Some of these challenges derive from the relevance that the university has achieved, their inescapable commitment to innovation, or the unquestionable dialogue with social agents to promote local, regional and international development. And all this in a context of questioning and debate about certain conflictive aspects such as funding, accountability or the governance model, among others.

Possibly, one of the crucial elements that will decisively influence the transformations above will be the search for the quality of education as a decisive axis in decision-making. Along the same lines, we can mention the reflections developed by the High Level Group on the Modernization of Higher Education (HLGMHE, 2013), which indicated that the demand for modernization of teaching methods and the increase of the quality of teaching in higher education will be a means to achieve the expected changes and the necessary progress.

It must be recognised that the improvement of the quality of higher education is subject to several factors, and it is not enough to declare its imperative need to achieve it. On the one hand, institutions of higher education are resistant to change, and above all, it should be noticed they tend to maintain and reward research as the fundamental task of academics in the system in place of teaching. On the other hand, teaching has often been seen as an intuitive practice, without taking into account the pedagogical research carried out on this subject. This situation has been denounced by a growing movement, in the last two decades, of those academics who consider teaching as a field of study, on which innovation, research, and improvement based on evidence can be conceived. This movement, called the "Scholarship of Teaching and Learning" (SoTL) (Boyer, 1990), promotes the practice of good teaching (firmly connected to student learning) and the inquiry about teaching (considering teaching as a study area). In short: it is about investigating how teachers exercise their teaching to be able to act by incorporating corrections and improvement mechanisms in those areas that require it, as well as helping to understand better what are the processes that make teaching achieve the objectives that are proposed with respect to student learning and, therefore, this can be considered quality.

In the United States, university policies are evolving to create spaces and rewards for these research approaches on university teaching, and there is evidence of numerous initiatives to improve teacher quality (Hutchings, Huber, & Ciccone, 2011). In Europe, this approach is more recent (Bolivar & Bolivar, 2014; Rué, 2013) and is still in progress.

In any case, regardless of the characteristics of the context and of the ways of valuing and supporting university teaching, there is agreement on two fundamental premises. The first one, the vision of the teacher as a key element for the achievement of good teaching practices, and the second one, the need to promote adequate training to ensure teacher professional development, as a basic condition for the improvement of higher education (Caena, 2011; Darling-Hammond & Richardson, 2009; Desimone, 2009). Moreover, it also seems clear that the training and professional development of university teachers should be based increasingly on evidence from research (O'Meara, 2006; Braxton, Luckey, & Helland, 2006), according to the SoTL movement.

The group of experts previously cited, in a subsequent report (HLGMHE, 2014), emphasize that teachers are "the most important actors in the implementation of pedagogical changes". Moreover, they add a recommendation, in the sense of seriously considering the use of technologies of information and communication (ICT) to achieve a substantial improvement in the quality of teaching in higher education.

In this sense, it is possible to bet and guarantee those processes and mechanisms that help teachers to perfect their work to improve their professional practice and their personal development to provide substantiate answers to new demands and contemporary educational needs. According to Hargreaves and Fullan (2014), professional capital must be based on rigorous training, continuous learning, going beyond the evidence, and being open to the needs and priorities of students and society.

ISBN 978-615-5511-25-7

Learning and teacher professional development in the digital era

In the digital era, in addition to expanding and multiplying, the training contexts become vague and indeterminate. It is for this reason that the improvement of the teaching performance requires to have the necessary digital skills, and it is essential that university teachers acquire them to increase the quality of their teaching (Ferrari, 2012; Ghislandi & Rafaghelli, 2014). Indeed, from the profound changes that characterize the networked society and, in particular, from the prominence of the technologies, a modification of the professional profiles has been promoted, and new knowledge and skills are required to be able to develop adequately both personally and professionally. Training processes are becoming increasingly important to ensure the necessary continuous learning of any person living in today's world. Internet and, specifically, several applications, programs, and platforms available represent a very important help for the development of training processes more in line with current needs and requirements due to they can be implemented overcoming the barriers of space and time.

Thus, learning does not develop linearly or in specific spaces but incorporates informal, and non-formal models into the formal educational models. Indeed, for decades we have attended the birth of virtual or online education offers, or the existence of online learning communities. More recently, thanks to mobile devices, new learning and training possibilities have been generated under signs such as ubiquitous learning, the establishment of personal learning environments (PLE), personal learning networks (PLN), and massive open online courses (MOOC), which are added to all previous resources and existing learning opportunities. Therefore, each person and each professional has a wide and diverse range of possibilities to learn that, to a large extent will depend on their characteristics and specific factors that have been shaped in their trajectory thanks to joint of strategies, relationships, and environments through which he has transited. Technologies expand the learning possibilities of individuals and groups.

Learning ecologies, according to Barron (2004), Jackson (2013), Sangrà, González-Sanmamed, and Guitert (2013) and González-Sanmamed, Sangrá, Souto-Seijo, and Estévez (2018), are the contexts and elements, of diverse nature, with or without a technological base, that people use for their training. These elements can be institutionalized face-to-face courses, participation in specialised social networks, the reading of books or the viewing of a television program. Every one of these elements is part of the learning ecology of an individual, and it will be each person who decides what, when and how to use each resource and each mechanism, also activating relationships with other people and environments that they can contribute the acquisition of new skills. This ecology, this set of elements, which goes beyond a social network (which would be one of those elements) or a community of practice (which could be another) is undoubted that, mediated by technology can expand its activities in proportion geometric, thus multiplying the creation of learning opportunities.

Taking as a substrate the possibilities of professional development offered to teaching professionals in the digital society, we are developing research with the purpose of revealing the processes, mechanisms and resources used by university teachers to learn and improve

ISBN 978-615-5511-25-7

their performance, as well as identify the possibilities offered by technology in formal, informal and non-formal learning, that they carry out throughout their professional trajectory. In conclusion, the focus of the study is the learning ecologies of university teachers. On the one hand, the importance of the study of ecologies as a frame of reference for the analysis of learning and training in the current contexts enriched by technology serves as a foundation for the relevance of this research. And, especially, its interest is justified by the characteristics of university teachers, in terms of the initial and permanent training to which they have access, and their particularities as teachers and researchers with greater capacity and opportunities for self-learning and training through a multitude of mechanisms, which can be of singular importance in the analysis of ecologies as a training reference and their implications for the improvement of university education.

Research on learning ecologies should allow us to understand better how individuals in an increasingly uncertain social context due to the action of information and communication technologies use all the resources and learning opportunities. Also, research on the learning ecologies of different groups will inform us about the differences in the way of approaching emerging phenomena in formal, non-formal or informal contexts, depending on the characteristics that define the groups of different nature and different expected behaviour.

Purpose

The improvement of the quality of university education is considered one of the fundamental elements to achieve a social, scientific and economic development according to the current context, as the most recent political and strategic documents indicate. Both the Spanish Strategy of Science, Technology, and Innovation, as well as the Horizon 2020 strategy promoted by the European Union, highlights the importance of the contribution of higher education.

Most of the empirical studies carried out demonstrate the influence of teacher training and, particularly, continuous training, as a decisive factor for innovation and the quality of their teaching performance, Therefore, it is very appropriate to explore how in our field, where technologies have a preeminent presence, and the connections and relationships between professionals facilitate the development of informal training processes, the concept of learning ecology is being used to bring into play resources, strategies, patterns and opportunities of training that have an impact in a better teaching performance. Moreover, the use of resources and training opportunities located in the network for self-learning can be a good foundation to assess those transformations required in the education system that will allow it to evolve from new organisational models of training management and evaluation.

The project will try to meet the following general aims:

1. Analyse how Spanish university teachers shape their learning ecologies and use them to benefit their professional development.

ISBN 978-615-5511-25-7

2. Specify the contribution of ICT in the development of learning ecologies in the current formal, non-formal and informal learning contexts.
3. Examine the influence of learning ecologies in the improvement of teaching practice and its impact on the quality of university education.
4. Propose actions and formulate guidelines that enrich learning ecologies to facilitate professional improvement and the quality of teaching at the university.

Method

Based on the purpose and objectives of the project, the study we propose attempts to respond to the parameters of basic research (aims to identify, analyse and specify the training pathways and learning mechanisms of university teachers, and possible connections with their teaching performance), and applied research (elaboration of training proposals and computing device with products and training offers mediated by technology). It is encouraged on some well-established methodological traditions such as the analysis of expert knowledge (knowledge capturing), the inquiry about the life stories and the study of the teacher's thought.

Furthermore, it should be indicated that the design and development of this research participates in the postulates of the interpretive paradigm, given that it is intended to investigate the internal processes of professional teacher learning, by following the research lines of the studies on learning to teach and professional knowledge and its correlation in university teaching practices. So in this way, we are trying to answer the how and why of the events and, above all, rescue the vision of the researched people and reveal the meanings that they give them. But some principles of the critical paradigm are also assumed. Because the study pretends not only the description and understanding of the learning ecologies throughout the life of the teachers, but also the transformation, both at the level of each teacher so that it can enrich their ecology and improve their professional activity, as well as at the level of training institutions, so that they adapt their offers to the needs and possibilities demanded and offered by the network society.

A mixed research design will be used that combines both quantitative and qualitative methodologies, based on what Bericat (1998) denominate integration logic and, specifically, looking for triangulation to ensure the validity and reliability of the study and guarantee a more holistic approach to phenomenon studied (Del Rincon et al., 1995; Hesse-Biber & Leavy, 2008; Sandín, 2003). Taking into consideration the topology exposed by Goetz and LeCompte (1988), we will be combined interactive methods of data collection, -that is, semi-structured interviews and a questionnaire-, with non-interactive methods, such as the analysis of documents. In this sense, Corbetta (2007) highlights the fact that quantitative and qualitative techniques lead to different knowledge, but that is where wealth resides since to understand better reality a multiple and multifaceted approach is needed.

From the point of view of time, the investigation is organised around four key core: preparatory analysis, through the Delphi technique; *micro* analysis, through case studies; *macro* analysis, using the survey technique; and complementary analysis of contrast, through

ISBN 978-615-5511-25-7

group interviews (also called focus group or discussion groups). This time we will focus on explaining the information related to the second phase of the research that has been developed through case studies.

The case studies have been developed through individual interviews and documentary analysis. We have based on the most prominent authors (Denzin & Lincoln, 2012; Guba & Lincoln, 1981; Flick, 2004; Stake, 1998; Simons, 2011) to support the decision to use the methodological strategy of the case study, as well as to design it and to develop it. Regarding the selection criteria of the cases, we will combine both the achievement of high qualification in the evaluation derived from the application of the Docentia program and the representativeness of the branches of science.

The individual interviews, of a qualitative nature, will be structured openly and will be developed in depth (Corbin & Strauss, 2014; Kvale, 2011; Merriam, 2014; Ruíz Olabuénaga, 2012; Simons, 2011). The first interview will be the biographical-initial, and it will collect the personal data of university teachers, their work career and their expectations about their training. It is about understanding the life history of university teachers (Bolívar, Domingo, & Fernández, 2001). The fundamental aim is to place the university teacher story within the framework of a broader contextual analysis; in other words, to construct a narrative of the action within a theory of context (Goodson, 2004). The second interview is about learning mechanisms and professional updating. It covers everything related to the resources and learning processes that teachers put into play to contribute to their continuing learning. That is to say; it is about being able to know and reflect on the environments and environments in which they interact and learn, as well as to understand the meaning and use that they attribute to ICT for the improvement of their teaching practice. It is about identifying specifically the learning ecologies of each one of the participants.

The biographical interview contained thirty-four questions through which we queried about the memories of each one of the educational stages and the professional stage. The most outstanding milestones of the person's life were valued, by identifying the relationships and influences received, and an attempt was made to reveal how experiences have shaped a way of learning and facing life and professional challenges.

The outline of the second interview consisted of forty-five questions through which we inquired about the most outstanding characteristics of the professional practice and specifically their performance as a university teacher in certain subjects and careers. In the second section of questions, the training activities that each teacher has carried out were analysed, as well as the evaluations that the formative institutional offer deserves compared to other non-formal and informal mechanisms. In a third section, they were asked about the use and potential of ICT in their training and teaching. Finally, through the questions collected in the last section, it was intended to reveal how the learning processes of each person are articulated, which are the most used resources and the aspects that most influence the way of acquiring new knowledge.

ISBN 978-615-5511-25-7

We have worked with seventy university teachers from several Spanish universities with different characteristics and with different personal and professional profiles. The participants were selected under the criterion of having obtained a high qualification in programs of evaluation of the quality of the teaching like the Docentia program or other specific ones that the universities use.

All participants were informed of the research purposes and gave their consent to participate in the study. We contacted them through email, and the anonymity and confidentiality of the collected data were guaranteed. Each university teacher was given the two interviews described above at separate times to avoid fatigue. The interviews were recorded in audio and later transcribed in Word to be analysed more easily.

A computer program called Atlas.ti was used to data analyse. The code system has been configured in a mixed manner, that is, on the one hand, the reference bibliography was taken into account but, above all, it has arisen from the data. Therefore, respect and consistency with what was expressed by each of the participants have been maintained.

The cross-sectional report, derived from the individual analyses carried out on the most valued university teachers of the participating universities, on the one hand, has revealed the importance of a series of elements that, in different ways, are shaping the ecologies of the participants and that can be considered key components of university teacher professional learning ecologies. On the other hand, recurrent aspects have also been found when characterizing how people construct their ecologies through their life trajectories. We will mention next each one of these two lines:

1. Elements that form the Ecologies: We have identified five main components, which will be described briefly below. The *personal* component, related to the internal and specific issues of each subject that characterise his way of facing learning, of positioning himself before the challenges and of feeling and self-perceiving himself in life and the profession. Through the component called *interactions*, we value the relationships that people have with other individuals that, at different times and in different ways, cross their path or become part of one of their environments (personal, family, work, friendship, etc.). The component named *resources* refers to the support, technological or not that each person has enjoyed and uses to learn. The *activities* component includes the actions and strategies that people have been using and incorporating as a response mechanism to the various situations they have to face both in their personal and professional development. Finally, the importance of the training component has also been revealed. It includes formal institutional learning, as well as the non-formal and informal opportunities that each person has been able to access at different stages of their professional career, and how this will shape a longlife and lifewide learning perspective.
2. The process of construction of the personal ecology: In the process of construction of the ecologies, the influences received from different people with which some type of link has been maintained acquire special importance. In the case of teachers, it is worth

ISBN 978-615-5511-25-7

noting the recognition of a significant footprint of teachers who have been involved in some of the educational stages and from which a memory is stored that is not only nostalgic but, in many cases, it reveals as a model to follow or from which some modes of action considered valuable are borrowed. Another key aspect is related to motivation for learning and, in particular, to the ability to promote self-directed learning that allows each subject to have control over their lives and decide on their personal and professional development processes. Finally, it is necessary to mention the existence of a set, sometimes dispersed and sometimes more articulated, of thoughts, ideas, visions, guesses, etc., from which certain conceptions of learning and training are maintained, both applied to her/himself and to a specific group (for example, university teachers).

Final considerations

From the literature, our results agree with the definition proposed by Jackson (2013), who cites different components in the ecology. These components are presented in the following quote: "An individual's learning ecology comprises their process and set of contexts and interactions that provide them with opportunities and resources for learning, development and achievement. Each context comprises a unique configuration of purposes, activities, material resources, relationships and the interactions and mediated learning that emerge from them" (Jackson, 2013; p.7).

In conclusion, qualitative research has allowed us to reveal a series of personal variables related to the aims and/or motivations that the teacher has in reference to their professional development and continuous training; and, secondly, a series of variables aimed at knowing what the context is like where that training and learning take place.

References

1. Barron, B. (2004). Learning ecologies for technological fluency in a technology-rich community. *Journal of Educational Computing Research, 31*, 1–37.
2. Bericat, E. (1998). *La integración de los métodos cuantitativo y cualitativo en la investigación social.* Significado y medida. Barcelona: Ariel.
3. Bolívar, A. & Bolívar Ruano, R. (2014). Docencia e investigación en el contexto de la universidad actual. *Espaço Pedagógico, 21*(2), 380-402.
4. Bolívar, A., Domingo, J., & Fernández Cruz, M. (2001). *La investigación biográfico-narrativa en educación.* Madrid: La Muralla.
5. Boyer, E. L. (1990). *Scholarship Reconsidered: Priorities of the Professoriate.* Princenton, N.J: The Carnegie Foundation for the Advancement of Teaching.
6. Braxton, J.M., Luckey, W., & Helland, P. (2006). Ideal and actual value patterns toward domains of scholarship in three types of colleges and universities. *New Directions for Institutional Research, 129*, 67-76. doi: https://doi.org/10.1002/ir.172

ISBN 978-615-5511-25-7

7. Caena, F. (2011). *Literature review Quality in Teachers' continuing professional development.* European Commission, Directorate-General for Education and Culture.
8. Corbetta, P. (2007). *Metodología y técnicas de investigación social.* Madrid: McGraw-Hill.
9. Corbin, J., & Strauss, A. (2014). *Basics of qualitative research: Techniques and procedures for developing grounded theory* (4th ed.). Los Angeles: Sage.
10. Darling-Hammond, L., & Richardson, N. (2009). Research Review / Teacher Learning: What Matters? *Educational Leadership, 66*(5), 46-53.
11. Del Rincón, D., Arnal, J., Latorre, A., & Sanz, A. (1995). *Técnicas de Investigación en Ciencias Sociales.* Madrid: Dykinson.
12. Denzin, N. K., & Lincoln, Y. (2012). *Manual de investigación cualitativa.* Madrid: Gedisa.
13. Desimone, L. M. (2009). Improving impact studies of teachers' professional development: Toward better conceptualizations and measures. *Educational Researcher, 38*, 181-200. doi:10.3102/0013189X08331140
14. Ferrari, A. (2012). *Digital Competence in practice: An analysis of frameworks.* Sevilla: Institute for Prospective Technological Studies.
15. Flick, U. (2004). *Introducción a la investigación cualitativa.* Madrid: Morata
16. Ghislandi, P., & Raffaghelli, J. E. (2014). Scholarship of teaching and learning for quality teaching and learning in higher education. *European Journal of Research on Education and Teaching, 1*(12), 107-128. doi: 10746/-fei-XII-01-14_08
17. González-Sanmamed, M., Sangrà, A., Souto-Seijo, A., & Estévez, I. (2018). Ecologías de aprendizaje en la Era Digital: desafíos para la Educación Superior. *Publicaciones, 48*, 11-38 doi: http://dx.doi.org/10.30827/publicaciones.v48i1.7329
18. Goodson, I. F. (Ed.) (2004). *Historias de vida del profesorado.* Barcelona: Octaedro.
19. Guba, E. G., & Lincoln, Y. S. (1981). *Effective Evaluation.* California: Jossey-Bass Publishers.
20. Hargreaves, A., & Fullan, M. (2014). *Capital professional.* Madrid: Morata.
21. Hesse-Biber, S., & Leavy, P. (Eds.) (2008). *Handbook of Emergent Methods.* New York: Guilford Press.
22. High Level Group on the Modernisation of Higher Education (2013). *Report to the European Commission on Improving the Quality of Teaching and Learning in Europe's higher education institutions.* Luxembourg: Publications Office of the European Union.
23. High Level Group on the Modernisation of Higher Education (2014). *Report to the European Commission on New Models of Learning and Teaching in Higher Education.* Luxembourg: Publications Office of the European Union.
24. Hutchings, P., Huber, M.T., & Ciccone, A. (2011). *The Scholarship of Teaching and Learning Reconsidered: Institutional Integration and Impact.* San Francisco: Wiley & Sons.

ISBN 978-615-5511-25-7

25. Jackson, N. J. (2013). The concept of learning ecologies. In N.J. Jackson, & B. Cooper (Eds.), *Lifewide Learning, Education & Personal Development* (chapter A5). Retrieved from http://www.lifewideebook.co.uk/conceptual.html.

26. Kvale, S. (2011). *Las entrevistas en Investigación Cualitativa.* Madrid: Ediciones Morata.

27. Merriam, S. B. (2014). *Qualitative Research: A guide to Design and Implementation.* San Francisco: Jossey-Bass.

28. O'Meara, K. (2006). Encouraging multiple forms of scholarship in faculty reward systems: Have academic cultures really changed? In J. Braxton (Ed.), *Analyzing faculty work and rewards: Using Boyer's four domains of scholarship* (pp.77-96). San Francisco: Jossey-Bass.

29. Rué, J. (2013). Formación docente del profesorado universitario. Una perspectiva internacional. *Revista de Docencia Universitaria, 11*(3), 17-22. Retrieved from http://red-u.net/redu/index.php/REDU/issue/view/73

30. Ruiz Olabuénaga, J. I. (2012). *Metodología de la investigación cualitativa.* Bilbao: Publicaciones Universidad de Deusto.

31. Sandín, M.P. (2003). *Investigación cualitativa en educación: fundamentos y tradiciones.* Madrid: McGraw-Hill.

32. Sangrà, A., González-Sanmamed, M., & Guitert, M. (2013, October). *Learning Ecologies: Informal Professional Development Opportunities for Teachers.* Paper presented at the 63th International Conference on Educational Media (ICEM), Singapore. Retrieved from https://ieeexplore.ieee.org/document/6820171/

33. Simons, H. (2011). *El estudio de caso: teoría y práctica.* Madrid: Morata.

34. Stake, R. E. (1998). *Investigación con estudio de casos.* Madrid: Morata.

Acknowledgments

This study has been conducted in the framework of the research project (ECO4LEARN-HE), funded by the Ministry of Economy and Finance (Reference EDU2015-67907-R).

ISBN 978-615-5511-25-7

Towards Personalized Guidance and Support for Learning
Proceedings of the 10th European Distance and E-Learning Network Research Workshop, 2018
Barcelona, 24-26 October, 2018
ISBN 978-615-5511-25-7

ENGAGING ONLINE LEARNERS THROUGH FORMATIVE FEEDBACK: UNED DEVELOPMENTS AND USE OF AUTOMATIZED AND MOBILE FEEDBACK FOR CLOSED AND OPEN-ENDED QUESTIONS

Miguel Santamaría Lancho, Angeles Sánchez-Elvira Paniagua, UNED, Spain

Summary

Formative assessment and personalised feedback are commonly recognised as key factors, both for improving student's performance and increasing their motivation and engagement (Gibbs & Simpson, 2005). Currently, the technological solutions to give formative feedback in large and massive online courses are reduced to different kinds of quizzes. Two solutions for innovating in the assessment of automated closed and open-ended questions, UNEDTrivial and GRubric, will be presented, as well as the results in its application to different undergraduate subjects in UNED.

On the one hand, UNEDTrivial is a gamified Moodle activity-plugin that delivers automatic Feedback for closed-ended question. Its development is based in the Testing effect, which means that answering questions after study sessions improves knowledge acquisition (Karpicke & Roediger, 2007); and Spaced education, meaning that spaced repetition of the same questions at specific intervals increases long-term retention (Kerfoot, 2009). Research in Educational Psychology has consistently showed the beneficial effects of these two effects on students' engagement and learning (van Gog & Swelle, 2015). On the other hand, GRubric is a Latent Semantic analysis-based tool for the automatic assessment and feedback delivery of open-ended questions. It has been developed by researchers of the Developmental and Educational Psychology Department of UNED (Spanish National Distance Education University).

Automatic feedback for closed-ended questions under a gamified and mobile approach: UNEDTrivial

According to different researchers (Black & William, 1998), feedback is the most powerful single factor to make a difference to a student's achievements (Hattie & Timperley, 2007).

Online learning platforms offer different possibilities of automatic assessment through closed-ended questions. However, under a learning-by-testing approach, enriched formative feedback could be more engaging that merely making use of self-evaluation quizzes. Previous research in the educational domain reveals that content learning can be enhanced because of the *testing* and *spacing* effects (Kromann, Jensen, & Ringsted, 2009).

- *Testing effect*: Testing is a more active and effective learning approach than passive learning without testing (e.g. reading, watching videos, etc.). The retention of long-term information is significantly enhanced when formative assessment is used.
- *Spacing Effect*: the information presented and repeated at intervals (spaced time), is learned and retained more effectively compared with traditional educational *binge and purge* methods.

Under these two main assumptions, Kerfoot developed his "Learning 'radically simplified'" approach applied to Medical Students in Harvard School, consisting of learning through formative feedback to a sequence of questions, used on a daily basis (Kerfoot et al., 2012). In view of the excellent results obtained by Kerfoot, a similar methodology has been developed in UNED to be mainly used with our undergraduate subjects. Therefore, UNEDTrivial has been developed to offer a mobile, adaptive and personalised feedback through a gamified learning activity that aims to foster students' motivation and engagement and to prevent procrastination. The application is published and available on the Moodle public site for plug-ins (https://moodle.org/plugins/mod_unedtrivial, developed by Juan David Castellón and Miguel Santamaría).

UNEDTrivial consists of quizzes as learning tools using, both, the spacing and testing effects. Also, it is a type of question and answer game in which students can compete with each other by earning points and badges. How does it work? Students can register in one UNEDTrivial. Each UNED Trivial consists of a set of closed-ended questions. The objective of the game is to remove all questions from the trivial. Once enrolled, the student receives N questions by email daily. For each correct answer the student gets X points, losing X points for each mistake. After each answer the student receives an in-depth explanation and the students' relative position on a leaderboard. After each wrong or correct answer, the question is re-sent within N days. One question is removed when it is answered correctly twice. When all questions are removed, the participant gets a bonus according to the number of trials required to remove the question: more trials lower bonus. Finally, after finishing a Trivial, the student receives a badge.

UNEDTrivial offers three types of questions: single answer, multiple answer, and short answer. To add questions two import items formats are available: Moodle XML OR a specific format of a plain text file. UNEDTrivial offers a learning analytic module. Overall, analytics show the number of participants and the number of participant's answers. It also has a mailing facility to send messages to specific groups of users (low active participants, for instance). Performance analytics and activity level per week are also available. Finally, participants and questions analytics are also available.

To add UNEDTrivial to a Moodle course is very easy. When the plug-in is added to a Moodle site, a course designer only need to turn on Moodle editing mode and choose UNEDTrivial between the activities available. Then, each UNEDTrivial can be configured depending on the designer objectives.

ISBN 978-615-5511-25-7

The first UNEDTrivial pilots have been developed on the academic course 2017-2018 in two different undergraduate subjects and degrees: Economic History (136 participants) and Psychology of Individual Differences (313 participants). Students could participate on a voluntary basis. Participation was not considered in the final mark. A final online questionnaire was used to test students' opinions and satisfaction about the experience. According to the results, our students thought that UNEDTrivial was mainly useful to consolidate what has been learned, to foster interest in the subject and to increase their motivation and to prevent from procrastinate. About the user's experience, our student said that they would like to be able to participate in this activity in another subjects; they loved to work with UNEDTrivial and considered it an opportunity for learning improvement. They founded it fun, as well. Our students also reported that they made use of dead times to answer daily questions, that means that UNEDTrivial helps students to get a better management of time, for instance when commuting. Functionalities such as UNEDTrivial may help part-time students to cope with difficulties at "finding a suitable time slot to learn during the day". We need tools to identify each student's best learning moments best learning resources available in each context tools for self-organize their learning day set realistic learning goals.

Automatic quick and iterative formative feedback to open-ended questions using a Latent Semantic Analysis tool: GRubric

Online students are regular users of technologies. As such, they always expect quick and iterative feedback. They love learning by trial and error. However, only technology can provide this quick and iterative feedback (Kiili, 2005; Oblinger, 2004). Quizzes have severe limitations to assess more complex learning outcomes and soft skills, including writing and oral communication. Our challenge in online environments is to give quick and iterative feedback for open-ended questions in a sustainable way by making use of technologies. Semantic technologies may allow coping with this challenge in a sustainable way.

GRubric is a Latent Semantic Analysis-based automatic assessment tool that has been developed by researchers at the Developmental and Educational Psychology Department of UNED and the Autonomous University of Madrid (UAM). GRubric is a set of three applications GallitoStudio, GallitoAPI and GRubric (Jorge-Botana, Olmos, & Barroso, 2013).

Our team of Economic History decided to cope with the challenge of giving online formative assessment for open-ended questions by testing GRubric possibilities. Therefore, personalized and automated formative and iterative feedback could be provided to our students to different types of open-ended questions (70-800 words). This feedback allowed our students to improve their answers and practice writing skills, thus contributing both to a better concept organisation and the building of knowledge.

To implement G-Rubric in a subject, we followed three steps:

ISBN 978-615-5511-25-7

- Step 1. To build up a specialized corpus (in our case in Economic History) making use of Gallito Studio app. Our corpus is based on our Economic History textbook and five more written by other Spanish professors.
- Step 2. To design several learning activities based on short open-ended questions, also making use of Gallito Studio. A GRubric activity has three elements: the question, a canon answer, or golden text, and some conceptual axes defined by descriptors.
- Step 3. Finally, to offer our students the possibility of participating in the activities by using a web interface called G-Rubric. Through this interface, the students sent their answers to a cloud application called Gallito API. This app compares the student's answer with a canon answer or *golden text* using as a reference the semantic space previously obtained, offering quick and rich feedback to the student.

Once the student registers in GRubric website, the student chooses an activity. Then the student can write down or paste an answer to the topic in an open text field by keyboard. Also, speech to text facility offered by mobile devices can be used to introduce the answer. After submitting an answer, the student receives immediately the feedback consisting of:

- A Content grade between 0-10.
- A Style grade (grammar) which should be upper to eighty to be correct.
- Also, for each conceptual axis, the student receives graphical feedback that shows to what extent the answer is close to the acceptance area delimited by two vertical grey lines, on the right side of the graph. That means, to what extent the answer is correct.

As shown in Figures 1 & 2, The graphical feedback lets the students know how they could improve their answer by adding new information in a next trial.

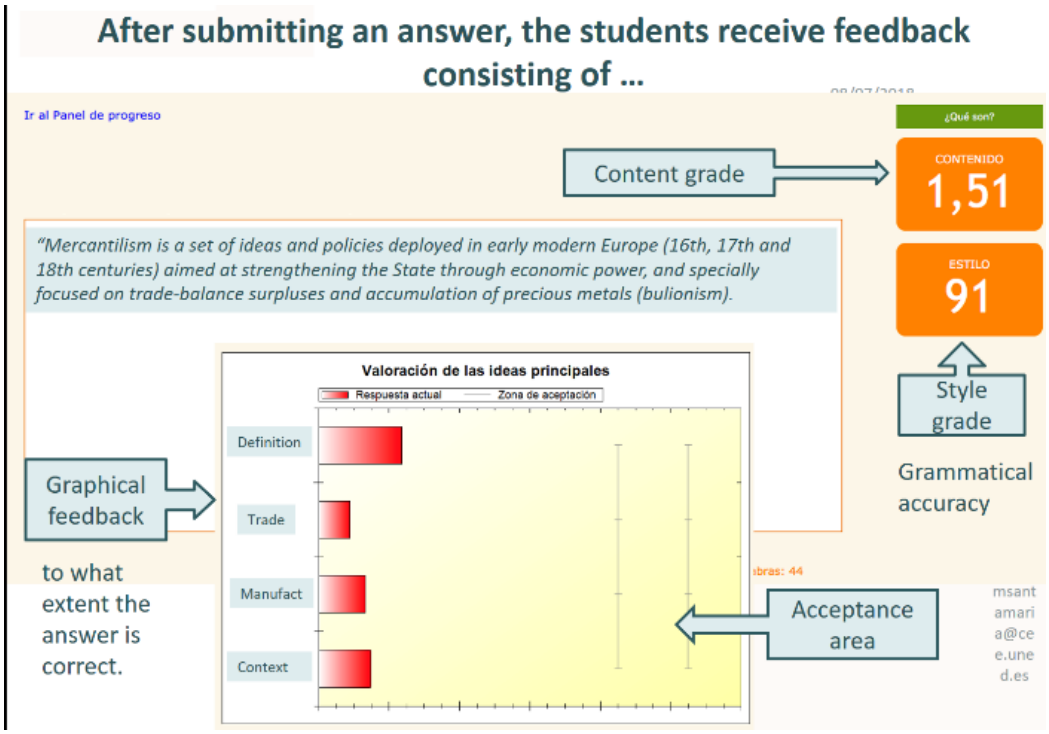


Figure 1. GRubric's feedback

ISBN 978-615-5511-25-7

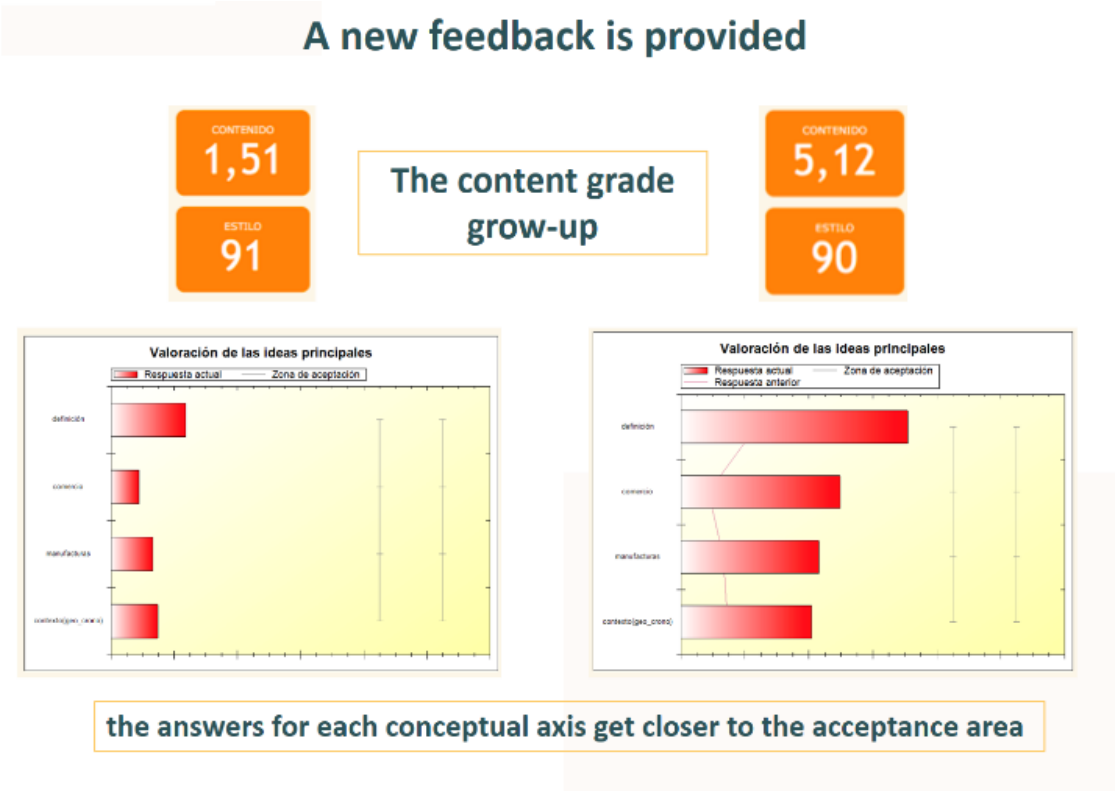


Figure 2. How iterative GRubric iterative feedbacks helps to improve students' performance

After checking this feedback, the student can review his previous answer again and make a new attempt adding, for instance, further information; in this example, about mercantilist policies. New feedback is then provided (Figure 2).

As can be seen in our example, after adding new information, the content grade grows up, and also the answers for each conceptual axis get closer to the acceptance area.

After some experiences during the last three years, we could verify how students using the feedback could improve their answers between the first and the last attempt. Regarding the students' agreement with the grades received 70% of students' reported that agreed very much or a lot whit the grade received. Students also report that Grubric's activities had a positive effect on his motivation. Furthermore, the 80% of students considered G-Rubric entirely or very much useful regarding exam preparation and more than 80% of students considered this experience *very much* or *totally* positive.

Conclusions

Formative feedback for close and open-ended questions, mediated by technologies, is a powerful tool to foster interest, engagement, and motivation and to improve time management and reduce procrastination. In the end, it helps at consolidate learning and promoting academic performance and student' s satisfaction.

Students need more formative assessment through continuous, gamified, mobile and personalized tools. We should invest to offer ubiquitous and personalized learning

ISBN 978-615-5511-25-7

environments, with adaptive capabilities for each student. In this sense, apps development (such as those presented here) could be on the basis for European projects partnership within distance education institutions

References

1. Black, P., & Wiliam, D. (1998). Assessment and classroom learning. *Assessment in Education: principles, policy & practice, 5*(1), 7–74. Retrieve from http://www.tandfonline.com/doi/abs/10.1080/0969595980050102
2. Gibbs, G., & Simpson, C. (2005). Conditions under which assessment supports students' learning. *Learning and teaching in higher education, 1*, 3–31. Retrieved from http://eprints.glos.ac.uk/3609/
3. van Gog, T., & Sweller, J. (2015). Not new, but nearly forgotten: the testing effect decreases or even disappears as the complexity of learning materials increases. *Educational Psychology Review, 27*(2), 247–264.
4. Hattie, J., & Timperley, H. (2007). The power of feedback. *Review of Educational Research, 77*(1), 81–112. doi: 10.3102/003465430298487
5. Jorge-Botana, G., Olmos, R., & Barroso, A. (2013). Gallito 2.0: A natural language processing tool to support research on discourse. *Proceedings of the 13th Annual Meeting of the Society for Text and Discourse*. Retrieved from http://elsemantico.es/Documentos/Gallito2_Valencia_new.pdf
6. Karpicke, J. D., & Roediger, H. L. (2007). Repeated retrieval during learning is the key to long-term retention. *Journal of Memory and Language, 57*(2), 151–162.
7. Kerfoot, B. P. (2009). Learning benefits of on-line spaced education persist for 2 years. *The Journal of urology, 181*(6), 2671–2673.
8. Kerfoot, B. P., Baker, H., Pangaro, L. Agarwal, K., Taffet, G., Mechaber, A. J., & Armstrong, E. G. (2012). An Online Spaced-Education Game to Teach and Assess Medical Students: A Multi-Institutional Prospective Trial. *Academic Medicine, 87*(10), 1443-1449. Retrieved from: http://oea.sites.medinfo.ufl.edu/files/2010/10/An-Online-Spaced-Education-Game-to-Teach-and-Assess-Medical-Students.pdf
9. Kerfoot, B. P., Fu, Y., Baker, H., Connelly, D., Ritchey, M. L., & Genega, E. M. (2010). Online spaced education generates transfer and improves long-term retention of diagnostic skills: a randomized controlled trial. *Journal of the American College of Surgeons, 211*(3), 331–337.
10. Kiili, K. (2005) Digital game-based learning: Towards an experiential gaming model. *The Internet and higher education, 8*(1), 13–24.
11. Kromann, C. B., Jensen, M. L., & Ringsted, C. (2009). The effect of testing on skills learning. *Medical Education, 43*(1), 21–27. https://doi.org/10.1111/j.1365-2923.2008.03245.x

ISBN 978-615-5511-25-7

12. Oblinger, D. (2004). The next generation of educational engagement. *Journal of Interactive Media in Education, 1*. https://doi.org/10.5334/2004-8-oblinger

13. Santamaría Lancho, M., Sánchez-Elvira, Á., Hernández Benítez, M., & Amor, P. (2016, October). Learning by testing. Spaced Education through Qstream platform in large number of students. *Proceedings of The Online, Open and Flexible Higher Education Conference*, 816-830. Retrieved from https://conference.eadtu.eu/download2415

14. Santamaría Lancho, Miguel & Hernández, Mauro & Sánchez-Elvira Paniagua, Ángeles & Luzón, José & Jorge-Botana, Guillermo. (2017, October). Using semantic technologies for giving a formative assessment and supporting scoring in large courses and MOOCs: first experiences at UNED (2015-2017). *Proceedings of The Online, Open and Flexible Higher Education Conference*, 458-473. Retrieved from https://conference.eadtu.eu/download2399

ISBN 978-615-5511-25-7

Towards Personalized Guidance and Support for Learning
Proceedings of the 10th European Distance and E-Learning Network Research Workshop, 2018
Barcelona, 24-26 October, 2018
ISBN 978-615-5511-25-7

THE IMPACT OF THE FLIPPED CLASSROOM METHODOLOGY IN THE ACQUISITION OF LEARNING TO LEARN COMPETENCE

Vicent Fornons, Departament d'Ensenyament, Ramón Palau, Universitat Rovira I Virgili, Spain

Abstract

This case study researches the impact of the fact of using the flipped classroom methodology in student's acquisition of the learning to learn competence. A survey to measure the student's competence level was used to carry out this case study, this survey was done before and after using the Flipped Classroom methodology. In this way, we were able to see the evolution in the acquisition of the competence.

Introduction

One of the basic skills for success in the knowledge society is the ability to learn. With increasingly rapid changes in the work place, in part due to changing technology and as a result of changing societal needs in the context of globalization, citizens must learn to learn in order to maintain their full and continued participation in employment and civil society or risk social exclusion. In this context learning to learn is an essential tool for lifelong learning and thus education and training needs to provide the learning environment for the development of this competence for all citizens including people with fewer opportunities (those with special needs including pre-school and adult learners) and through different learning environments (formal, non-formal and informal) (Fredriksson & Hoskins, 2007).

The term Flipped Classroom is used to describe a new methodology. One of the pioneers on using this expression was Lage, Platt, and Treglia (2000). Although, the expression actually did not become established until in 2007 chemistry teachers Jonathan Bergmann and Aaron Sams at Woodland Park High school started to record and upload their lessons online for students to watch at home. So, there was more time left for lab practise, problem-solving tasks and personalized comments on each of the student difficulties. They were surprised when English speaking teachers and students from all over the world started to send them emails to thank them for the videos.

In the Flipped Classroom methodology all the work that used to be done at home is now done in class and vice versa. Learning material such as reading texts, podcasts, powerpoints, or explanatory videos are delivered online to students by the teacher and students take notes of it. The tasks are done and conveyed out-of- class hours and classroom time is used to develop cognitive skills and to carry out activities and projects through interaction with peers and teachers. This alternative use of time allows a second inversion in the teacher's role, who

becomes a facilitator. Moreover, learning in class moves away from passive learning towards active learning where students engage actively. (Prieto, 2013)

Theoretical Framework

There are case studies which prove that using Flipped Learning helps to improve students' academic performance, as well as their engagement with the subject, critical-thinking and collaboration. (Ali, Ghazi, Shahzad, & Khan, 2010; Bergmann & Sams, 2011; Strayer, 2007).

It has also been confirmed that using the Flipped Classroom approach improves the teacher-student behaviour and interaction (Flumerfelt & Green, 2013). In addition, it enables students active learning (Leicht, Zappe, Messner, Litzinger, & State, 2012). Wilson (2013) also pointed out that using the Flipped Classroom increases student participation and improves their performance. Another case study shows that by using the Flipped Classroom, about 80% of the students learn all the major contents in comparison with only 20% who do it through the traditional method. (Bergmann & Sams, 2012)

However, there is no research work on the effect of the Flipped Classroom methodology in the acquisition of diverse competences such as the learning to learn competence.

The learning to learn concept was adopted in response to new challenges and demands on the educational evaluation, changes in social and working macro levels and working processes micro levels. It refers to the diverse cognitive and affective dimensions which are key to implement prior skills in new tasks and new learning. Learning to Learn is created through good educational practice and accompany all the achievements. It inclusion as a distinctive indicator in the assessment could provide a means of analysing the relative role of the diverse factors which affect student's performance, and it will help to guide schools towards practice and contents that truly enhance lifelong learning.

There are several research projects on how to measure the learning to learn competence. There is a combination of three national tests within the European test: The University of Helsinki test (LEARN), the University of Bristol test(ELLI) and the Dutch test(CCST). There are also international tests such as PISA worth mentioning. However, the research projects outcome shows that these tests do not fully cover all of the aspects of learning to learn and tend to use affective questions as explanatory variables to get test results rather than measure test results (Hoskins & Fredriksson, 2008).

There are no case-studies that use the different test mentioned above regarding the Flipped Classroom methodology, a survey which was created and validated by the Ministry of Education, Culture and Sports of the Kingdom of Spain, specifically by the Career Advisor and Information Area was used in this research project. With their permission to be used in research work. The survey measures the level of Learning to Learn Competence acquired, before and after using Flipped Learning, to find out if it affects the acquisition of Learning to Learn Competence.

ISBN 978-615-5511-25-7

Methodology

To carry out this research project a quantitative method was chosen to obtain a positivist, tangible and objective view external to the researcher. With this approach they attempt to generalize results from representative samples; based on objective principles, empirical evidence and quantification; establishes as quality criteria, validity, reliability and objectiveness; its goal is to know and explain reality to monitor and make predictions about it; as well as the verification, contrast or falsification of hypothesis (Albert, 2007; Latorre, Rincón, & Arnal, 2003; Mateo & Vidal, 2000).

The groups in this research project are not equal since they are not being monitored and they are chosen randomly. The surveys were sent to all kind of universities who were willing to participate in this research. This also entails the difficulty of monitoring all variables of diverse real contexts. Therefore, we are dealing with a quasi-experimental research; which reduces it inner validity, but increases its outer validity.

Since there isn't a controlled group, the research has a chronological series design, which consist of measures made to evaluated people, before and after the experimental variable has been introduced which is in this case the use of the Flipped Classroom. In addition to this, we encounter a paired design, since the same individuals are observed before and after a particular intervention.

To carry out the research online questionnaires with Likert scale are used. (*never* – 1, *sometimes* – 2, *often* – 3, and *always* – 4). These quantify the perception in the starting level of the Learning to Learn Competence and the final level after using the Flipped Classroom Methodology.

When the answers of both questionnaires are compared we can see the influence of the methodology in the diverse skills.

The proposed hypothesis is that using the Flipped Classroom Methodology favour the acquisition of the Learning to Learn Competence. To verify or reject this hypothesis a non-parametric Test was used since the variables do not show a normal sample distribution, which is one of the criteria. (Rubio Hurtado & Berlanga Silvestre, 2012)

Among the main non-parametric sadistic tests, the Wilcoxon T- test has been used for two related samples, with pre and post mean. The pre measures are the results of the survey before using the Flipped Classroom Methodology and the post measures are the results of the survey after using the method. (Berlanga Silvestre, & Rubio Hurtado, 2012)

The surveys were sent to over 100 university teachers who use the Flipped Classroom methodology in Spain. At the end 2 teachers collaborated making it possible for 49 university students from 2 different universities to answer the questionnaires.

ISBN 978-615-5511-25-7

Outcome

Table 1: Wilcoxon T-Test obtained results

Questions	Wilcoxon T-Test Result
01 – I am self-efficient when it comes to learning	0.669
02 – I am disciplined when learning	0.648
03 – I am able to set and achieve goals	0.251
04 – I am willing to train for any changes that could arise while learning	0.201
05 – I admit my mistakes to others without any trouble.	0.196
06 – I am able to look for new strategies without becoming hazy	0.059
07 – I admit my weak points and I try to improve them.	0.064
08 – If I make mistakes when making decisions, I am flexible to find solutions	0.145
09 – I analyse my mistakes to find solutions.	0.184
10 – I can find and use the information I need	0.175
11 – I use online resources to learn (WebCT, Moodle,...)	0.151
12 – I can search online information I need about a topic	0.001
13 - I find out courses or opportunities to improve my knowledge.	0.508
14 – I know where to go to get the information I need to improve my knowledge.	0.117
15 – I can prioritize tasks according to how important and urgent the results are	0.023
16 – I am happy with my temporary organization since I have got enough time for my school work.	0.329
17 – I can overcome unexpected events without essentially modifying my temporary organization.	0.867
18 – I can easily distinguish distractors which make me waste time	0.258
19 – To get my work organized I have some tools like a diary, a laptop, etc…	0.313
20 – I delegate responsibilities to the right people to be able to meet the deadlines.	0.260
QUESTIONAIRE'S MEAN LEARNING TO LEARN	0.271

Table 2: Means obtained before and after

Questions	BEFORE Means	AFTER Means	Difference
01	3.04	3.08	+ 0.04
02	3.02	3.06	+ 0.04
03	2.90	3.04	+ 0.14
04	3.49	3.61	+ 0.22
05	2.90	3.04	+ 0.14
06	2.69	2.94	+ 0.25
07	3.00	3.24	+ 0.24
08	3.06	3.24	+ 0.18
09	3.10	3.27	+ 0.16
10	3.00	3.12	+ 0.12
11	2.37	2.55	+ 0.18
12	3.35	3.73	+ 0.38
13	2.49	2.55	+ 0.06
14	2.63	2.80	+ 0.17
15	3.06	3.31	+ 0.25
16	2.76	2.61	- 0.15
17	2.61	2.63	+ 0.02
18	2.98	3.14	+ 0.16
19	3.22	3.37	+ 0.15

ISBN 978-615-5511-25-7

20	2.57	2.71	+ 0.14
MEAN	2.91	3.05	+ 0.11

Table 3: Ranks Obtained

Questions	Negative Ranks	Positive Ranks	Draws
01	9	9	31
02	10	13	26
03	11	17	21
04	6	13	30
05	8	15	49
06	10	21	18
07	9	18	22
08	12	18	19
09	10	17	22
10	5	9	35
11	11	19	19
12	3	19	27
13	9	14	26
14	9	17	23
15	6	16	27
16	16	10	23
17	10	11	28
18	9	17	23
19	8	15	26
20	11	15	23
MEANS	9.1 (18.14 %)	15.15 (30.22%)	25.9 (51.64%)

Negative Ranks: After < Before
Positive Ranks: After < Before
Draw: After < Before

Debate

We can observe on Table 1 that the Wilcoxon T. Test applied to the median of the scores obtained from all questions in the survey result in 0.271. To confirm the hypothesis that using the Flipped Classroom methodology helps to acquire the Learning to Learn Competence the result of the Wilcoxon T-test should have been lower than 0.05. Since the null hypothesis (Ho) is that the Flipped Classroom Methodology hasn't affected the change and the alternative hypothesis (H1) is that it has affected it and the significance level established in social science and psychology is usually 0.05. When observing in detail only 2 questions, 12 (0.01) and 15 (0.023) the result has been below 0.05, in the others the result is higher.

Table 2 shows us the average of the scores obtained in each question before and after applying the Flipped Classroom Methodology, here we can see that in all but one has been an increase on the average of the scores. However, just as shown on Table 1, these increases cannot be sadistically attributed to the use of the Flipped Classroom Methodology.

ISBN 978-615-5511-25-7

Finally, on Table 3, we can see the amount of students who have decreased their scores (negative rank), the ones who have increased (positive rank) or the ones who have not changed (draws) in relation to the initial scores before using the Flipped Classroom Methodology. In most cases, of 51.64% average, the results have been the same before and after; in the 30.22% there has been an increase in the scores and on the contrary in the 18.14% there was a decrease. The data collected reinforces the information obtained from Table 2, in other words they have remain the same or they have increased in over 80% of the cases after using the Flipped Classroom Methodology.

Conclusions

Even though in some results of particular questions we can verify the hypothesis, in most cases we can't. Therefore, with the obtained results we cannot confirmed the hypothesis that using the Flipped Classroom Methodology helps acquire the Learning to Learn Competence. Although an increase has been established in most students.

With the data gathered in this case-study we can conclude that using the Flipped Classroom Methodology does not help significantly to acquire the Learning to Learn Competence. However, this assertion must be put into context since there are two main factors that could make the results vary if a new case-study using the same questionnaire is carried out.

The first important factor is the amount of samples that we were able to obtain which were from 49 university students thanks to the collaboration of 2 university teachers. Taking into account and according to data recorded of teachers using the Flipped Classroom Methodology in Spain, there are 115 university teachers, a 1.74% of collaboration has been obtained from university students who use this methodology. As you can see, this amount of samples is not representative of the total of students and teachers using the Flipped Classroom Methodology.

The second factor is the inability to be certain if the teachers who collaborated in the research are actually using the Flipped Classroom Methodology properly or they are simply showing videos to students without applying a truly active learning focused on students and making them responsible for their learning. The Flipped Classroom Methodology helps to introduce the actual learning of the XXI century, it manages to insert informal learning into the forma, it allows a significant personalisation in the student learning process and, above all, it allows to invest in class (Fernández Naranjo, 2015).

In conclusion, this case-study is a first attempt to verify the utility of the Flipped Classroom Methodology in the acquisition of the Learning to Learn Competence, being in this sense, a pioneer case-study which attempts to create a basis for future research projects on the possibilities of Flipped Classroom in relation to basic competences students should acquire throughout their studies.

References

1. Albert, M. J. (2007). *La investigación educativa: claves teóricas.* Madrid: McGraw-Hill.

ISBN 978-615-5511-25-7

2. Ali, R., Ghazi, S. R., Shahzad, S., & Khan, H. N. (2010). The impact of brain based learning on students academic achievement. *Interdisciplinary Journal of Contemporary Research in Business, 2*(2), 542.556.
3. Bergmann, J., & Sams, A. (2011, April 15). How the flipped classroom is radically transforming learning. The Daily Riff [Blog post]. Retrieved from http://www.thedailyriff.com/articles/how-the-flipped-classroom-is-radically-transforming-learning-536.php
4. Bergmann, J., & Sams, A. (2012). *Flip your classroom: Reach every student in every class every day* (1st ed.). United States of America: International Society for Technology in Education.
5. Berlanga Silvestre, V., & Rubio Hurtado, M. J. (2012). < Artículo metodológico > Clasificación de pruebas no paramétricas. Cómo aplicarlas. *Revista d'Innovació i Recerca En Educació, 5*, 101–113. https://doi.org/10.1344/reire2012.5.2528
6. Fernández Naranjo, M. J. (2015, November 13). Qué es y qué no es flipped classroom | The Flipped Classroom [Blog post]. Retrieved April 21, 2018, from https://www.theflippedclassroom.es/que-es-y-que-no-es-flipped-classroom/
7. Flumerfelt, S., & Green, G. (2013). Using Lean in the Flipped Classroom for at Risk Students. *Educational Technology & Society, 16*, 356–366.
8. Fredriksson, U., & Hoskins, B. (2007). The development of learning to learn in a European context. *Curriculum Journal, 18*(2), 127–134.
9. Hoskins, B., & Fredriksson, U. (2008). *Learning to Learn: What is it and can it be measured?* https://doi.org/10.2788/83908
10. Lage, M., Platt, G., & Treglia, M. (2000). Inverting the classroom: A gateway to creating an inclusive learning environment. *The Journal of Economic Education, 31*(1), 30-43. Retrieved from https://www.jstor.org/stable/1183338?seq=1#metadata_info_tab_contents
11. Latorre, A., Rincón, D., & Arnal, J. (2003). *Bases metodológicas de la investigación educativa.* Barcelona: Edicions Experiencia.
12. Leicht, R. M., Zappe, S. E., Messner, J. I., Litzinger, T., & State, P. (2012). Employing the classroom flip to move lecture out of the classroom. *Journal of Applications and Practices in Engineering Education, 3*(1), 19–31.
13. Mateo, J., & Vidal, M. C. (2000). *Mètodes d'investigació en educació.* Barcelona: Universitat Oberta de Catalunya.
14. Prieto, A. (2013). Flipped classroom ¿cuáles son sus ventajas? ¿cuál es su origen? Profesor 3.0 [Blog post]. Retrieved March 28, 2014, from http://profesor3punto0.blogspot.com.es/2013/07/que-es-eso-de-la-flipped-classroom-para.html

ISBN 978-615-5511-25-7

15. Rubio Hurtado, M. J., & Berlanga Silvestre, V. (2012). Cómo aplicar las pruebas paramétricas bivariadas t de Student y ANOVA en SPSS. Caso práctico. *Revista d'Innovació i Recerca En Educació, 5*, 83–100. https://doi.org/10.1344/reire2012.5.2527
16. Strayer, J. (2007). *The effects of the classroom flip on the learning environment: A comparison of learning activity in a traditional classroom and a flip classroom that used an intelligent tutoring system.* Ohio State University.
17. Wilson, S. G. (2013). The flipped class: A method to address the challenges of an undergraduate statistics course. *Teaching of Psychology, 40*(3), 193–199.

ISBN 978-615-5511-25-7

Towards Personalized Guidance and Support for Learning
Proceedings of the 10th European Distance and E-Learning Network Research Workshop, 2018
Barcelona, 24-26 October, 2018
ISBN 978-615-5511-25-7

AN EXPERIENCE OF FLIPPED CLASSROOM FOR THE TRAINING OF FUTURE TEACHERS

Ramon Palau, Tania Molero, Universitat Rovira I Virgili, Spain

Abstract

This paper reports the results of an exploratory research on the perception that students of the degrees of education of the Rovira i Virgili University that had been experienced a module of Multimodal Literacy through the teaching-learning model Flipped Classroom and the relationship that establishes between this and the qualifications obtained in said module. To do this, a questionnaire has been provided through the Google forms tool to all students in the population once the experience is over. In general, a very positive assessment is perceived regarding this model and there are high coincidences between the level of satisfaction and the qualifications obtained, which apparently have a relationship with the motivation evoked by the Flipped Classroom model.

Introduction

The paradigm of Flipped Classroom or inverted instruction model was used for the first time by Jonathan Bergmann and Aaron Sams in 2012, who after some changes in their classrooms, decided to make sense of this new educational practice making the Flipped Classroom a model of teaching -learning. This learning model is based on the constructivism and social learning theory of Bandura (Jeong et al., 2016). The main argument that sustains this model is that direct instruction and the conference format are not an effective teaching tool in the educational space that is occupied today (Bergmann & Sams, 2012) and, therefore, must be invested. What in a regular classroom is explained through a lecture by the teacher, with this model is done asynchronously, from any other place, through short videos and readings. This frees up time in the classrooms to occupy them in more practical and dynamic active activities with the students (Jeong et al., 2016).

Through Flipped Classroom an environment is created where the student must take charge of their own learning, making it autonomous and collaborative. Autonomous because it will be the student himself who establishes his priorities and collaborative because he is not alone, since tutors and classmates will exchange information and learning inside and outside the classroom. It is also a flexible learning methodology, better known as blended learning, which, compared to fully online teaching, offers the benefits of face-to-face and non-face-to-face learning for students (Wanner & Palmer, 2015).

It is, therefore, a very flexible teaching-learning model, where students can learn, among other media, through various multimedia materials, such as videos and podcasts of short duration, among many others, to which they can be access an unlimited number of times, so we can say that this new model fits the individual needs of each student taking into account the different learning rhythms (Educause, 2012; 13, Perdomo, 2016; Wanner & Palmer, 2015). In this sense, as pointed out by Sánchez, Solano, and González (2016), the use of a multitude of resources is especially necessary in the Flipped Classroom. It must be taken into account that "not all contents are suitable for working through videos and that the suitability of the material must prevail above all", as indicated by Spencer, Wolf, and Sams (2011), cited in the article by Santos Urbina and others (2015). On the other hand, we must not forget that in this way, class time is released to facilitate student participation, actively ask and discuss, perform the practical part of solving problems, ideas application exercises, experiments, discussions, with This makes the class session more enjoyable and interactive (Molés & Monferrer, 2014, O'Flaherty & Phillips, 2015, Tourón & Santiago, 2015, Wanner & Palmer, 2015).

Aims

The general objective of this research is to describe and relate the perception that students have of the subject of multimodal literacy of 1 grade of the degrees of Education of the Rovira I Virgili University on the use of the Flipped Classroom and the academic results obtained in this matter.

The specific objectives that arise for this research are the initials of the plants raised after the review of various sources on the subject exposed. These are the following:

1. Describe the perception that students have about the Flipped Classroom model.
2. Explore the possible relationship between students' academic results and their perception of the Flipped Classroom.
3. Explore the possible relationship between the level of satisfaction and the motivation that students present with this model

Method

From the point of view of the paradigm, this research is located in the naturalist paradigm, since its objective is to understand and interpret a reality (Ferrández, 2006), in this case of the present study, to understand the perception that students have before the experience of a change of teaching model in a block of one of its subject of the first year of the degrees of education.

Given the characteristics of the study, we opted for the adoption of a mixed method, where researchers use qualitative and quantitative data for a better understanding of the phenomena to be investigated (Rodríguez Gómez et al., 1999).

ISBN 978-615-5511-25-7

Context and sample

The context in which this research is developed is all the students of higher education, specifically those who are enrolled in the first year of the degrees of Pre-Primary Education, Primary Education, Double Degree (Pre-Primary Education and Primary Education), Pedagogy and Social Education of the Rovira i Virgili University who was been enrolled in the subject "Communicative Skills", during the 2016/17 academic year. During the first semester of the subject, students studied a block of contents entitled "Multimodal Literacy" taught with the Flipped Classroom teaching-learning model. In this block a total of 12 sessions of 4 synchronous hours of duration divided into 12 weeks were given, that is, a weekly class for approximately three months.

Table 1: Sample of the study according to the university degree and the total participation of the students

UNIVERSITY	DEGREE	STUDENTS ENROLLED	ANSWERS OBTAINED	% OF THE SAMPLE IN RELATION TO THE TOTAL
URV. Campus Sescelades	Double Degree	30	29	96.66%
	Pre-Primary Education	81	52	64.19%
	Primary Education	81	61	75.31%
	Pedagogy	51	30	58.82%
	Social Education	54	31	57.41%
URV. Baix Penedés (Coma-ruga)	Pre-Primary Education	42	40	95.24%
TOTAL		339	243	71.68%

Instrument

From the point of view of the chosen methodology, the instrument designed for the collection of data, both qualitative and quantitative, is a questionnaire. The questionnaire we are going to use is one adapted from a previous investigation by Sosa and Palau that will be published in brief (2017). In addition, we should add that we will obtain the qualifications obtained in the module of Multimodal Literacy experienced with Flipped Classroom of the students of the sample during the academic year 2016/17 in order to be able to answer the questions posed.

The questionnaire is composed of 6 introductory questions related to the personal data of the student, maintaining their anonymity, and a battery of 48 opinion questions, of which 8 are closed response using Likert scales or item selection.

The questionnaire was administered electronically by email with a direct link to the Google Forms tool where participants had to answer all questions without exception. Through the following link you will access the administered questionnaire (in Catalan):
https://goo.gl/forms/UiLaAido77UzDeqv2

ISBN 978-615-5511-25-7

Results

Overall assessment of the model

As Figure 1 shows, we find that fashion is in the *Satisfied* assessment when asked "What general assessment do you make of the Flipped Classroom model?" Although the second most repeated assessment was *neither satisfied nor dissatisfied*, so that we can extract that the sample, in general, makes a positive assessment of the Flipped Classroom model.

If we look at the assessments taking into account the levels of education from which the students come, on the one hand, we can observe a lower satisfaction in the group of the Coma-ruga Pre-Primary teachers' degree, being the answer of greater frequency *neither satisfied nor unsatisfied*. On the other hand, we can see that the group with the highest satisfactory rating (*satisfied* and *very satisfied*) is the Primary Education group with 78.69% of the students, followed by the Pedagogy group with 76.66% and the Social Education group with 70.96%.

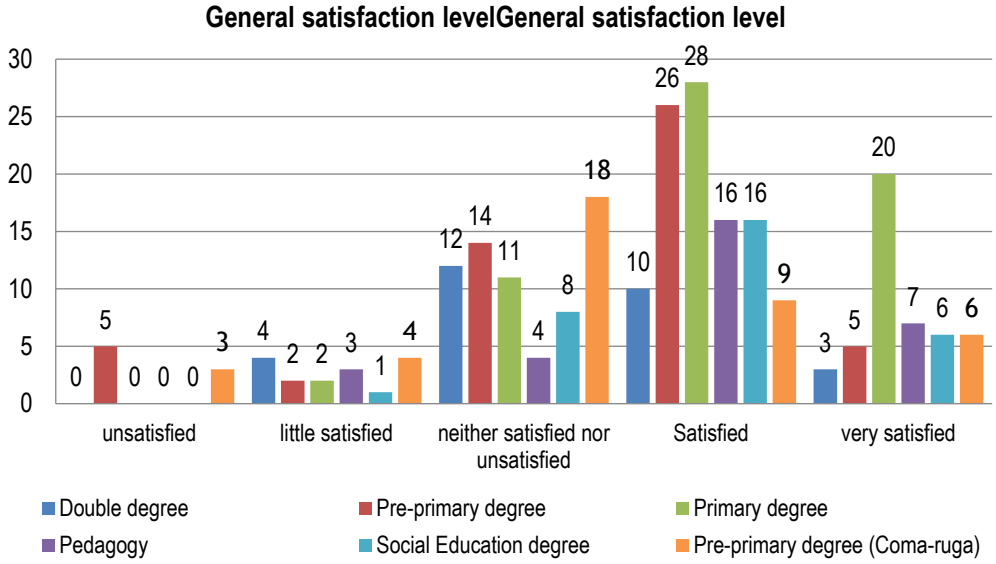


Figure 1. Level of general satisfaction of the students in the sample

A fact that could justify these results is the teacher. As we have previously specified, we find that the teacher is a dependent variable, since depending on the degree the teacher can vary. So we could interpret that the teacher can be a determining factor in the assessment that students make about the Flipped Classroom model.

Relationship between the perception and the obtained qualifications

Regarding the relationship between the perception and the grades obtained by the students in the Multimodal Literacy module, we will start again from question 40 of the questionnaire and the grades of the students in the sample.

10th EDEN Research Workshop Proceedings, 2018, Barcelona
ISBN 978-615-5511-25-7

The highest frequency of students (63 subjects) rated the experience with the *Satisfied* label – the fourth point of five of the Likert scale that we raised in the questionnaire – and obtained a qualification between 70 and 89.99 points out of 100 (Figure 2).

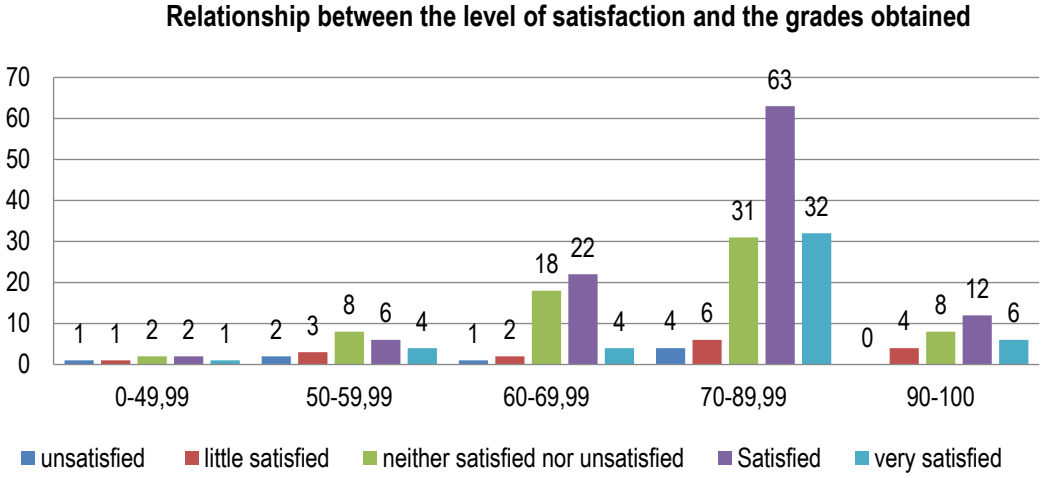


Figure 2. Relationship between the level of satisfaction and the qualifications obtained in the Multimodal Literacy module

Thus, we can extract that the degree of satisfaction can positively influence the final grades of the course, subject or block that is being taught with the Flipped Classroom model.

Relationship between the degree of satisfaction and motivation

Regarding the relationship between the level of satisfaction and question 44 of the questionnaire about whether they had been motivated to learn and investigate with this methodology, we can see that it seems that when a student has a positive and satisfactory perception of this model, he or she presents an attitude more positive and predisposed to learning, therefore, more motivated.

In addition, 114 students who have answered *Yes* to the question about motivation have obtained scores equal to or higher than 70 points out of 100, as you can see in Figure 3. Thus, we can also observe that there is a relationship between the level of motivation of the students who have worked with the Flipped Classroom model and their final grades, making the higher the motivation, the higher the grades obtained.

ISBN 978-615-5511-25-7

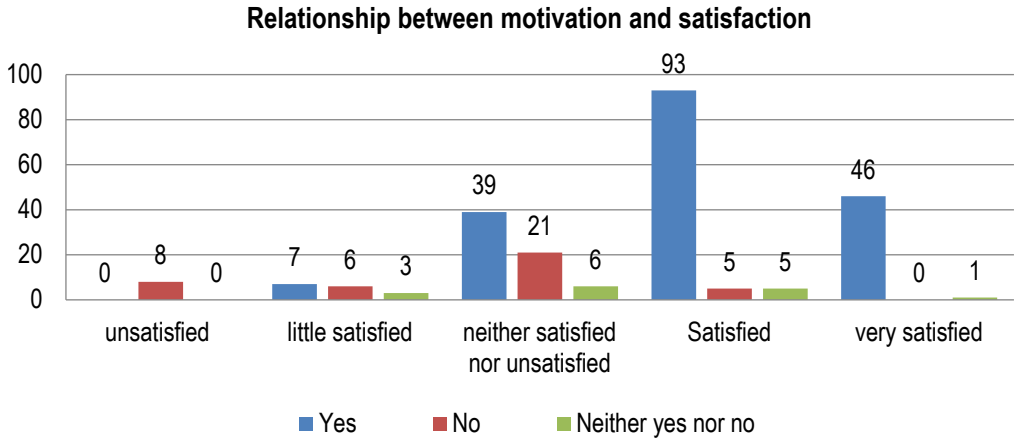


Figure 3. Relationship between perceived motivation and the level of overall satisfaction of the model

Conclusions

With this information we have been able to achieve the three objectives that we had set ourselves at the beginning and to answer the questions that prompted this investigation. First of all, we have been able to explore the perception that first-year students have of the Education degrees (Pre-Primary Education, Primary Education, Double Degree of Pre-Primary and Primary Education, Pedagogy and Social Education) of the Rovira i Virgili University enrolled in the core subject of "Communicative Skills" before the teaching-learning experience through the Flipped Classroom model.

Secondly, we have been able to observe in an exploratory way that there is a relationship between the perception that students have of this subject and their final grades, being the relationship "to greater satisfaction, better academic results".

And, finally, in the third place, we have explored the possible relationship between the perception that students have about their motivation with this teaching-learning model and their grades obtained in the block. In our case, the relationship established is that those students who have been motivated during the "Multimodal Literacy" block have obtained better grades than those who have shared not having felt motivated, although this is not a *sine qua non* condition.

References

1. Bergmann, J., & Sams, A. (2012). *Flip Your Classroom: Reach Every Student in Every Class Every Day.* International Society for Technology in Education.
2. Educause (2012). *7 things you should know about Flipped Classrooms.* Educause. Retrieved from https://net.educause.edu/ir/library/pdf/eli7081.pdf
3. Ferrández, R. (2006). *Métodos de Investigación en Educación* (Material docente). Castellón: Universidad Jaume I.

ISBN 978-615-5511-25-7

4. Jeong, J. S., González-González, D., & Cañada-Cañada, F. (2016). Students' Perceptions and Emotions Toward Learning in a Flipped General Science Classroom. *J Sci Educ Technol., 25*, 747-758. doi: 10.1007/s10956-016-9630-8
5. Molés, J., & Monferrer, L. (2014). Flipped Classroom al laboratori. *Ciències: Revista Del Professorat de Ciències de Primària I Secundària, 27*(27), 9–14. Retrieved from http://dialnet.unirioja.es
6. O'Flaherty, J., & Phillips, C. (2015). The use of flipped classrooms in higher education: A scoping review. *The Internet and Higher Education, 25*, 85–95. Retrieved from http://doi.org/10.1016/j.iheduc.2015.02.002
7. Pérez, Z. P. (2011). Los diseños de método mixto en la investigación en educación: Una experiencia concreta. *Revista Electrónica Educare, 15*(1), 15-29.
8. Rodríguez Gómez, G., Gil Flores, J., & García Jiménez, E. (1999). *Metodología de la investigación cualitativa.* Málaga: Ediciones Aljibe.
9. Tourón, J., & Santiago, R. (2015). El modelo Flipped Learning y el desarrollo del talento en la escuela. *Revista de Educación, 368*, 174–195. http://doi.org/10.4438/1988-592X-RE-2015-368-288
10. Urbina, S., Arrabal, M., Conde, M., Ordinas, C., & Rodríguez, S. (2015). Flipped classroom a través de videoconferencia. Un proyecto de innovación docente. *Campus Virtuales, 4*(2), 60-65.
11. Wanner, T., & Palmer, E. (2015). Personalising learning: Exploring student and teacher perceptions about flexible learning and assessment in a flipped university course. *Computers and Education, 88*, 354–369. https://doi.org/10.1016/j.compedu.2015.07.008

ISBN 978-615-5511-25-7